DRAFT

ENVIRONMENTAL ASSESSMENT
FOR
CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITY, BASE LIVING QUARTERS, AND AIRCRAFT PARKING APRON AT WAKE ISLAND AIRFIELD, UNITED STATES

Prepared by:

Department of the Air Force

August 2024

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DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA) FOR INSTALLATION DEVELOPMENT AT WAKE ISLAND AIRFIELD, UNITED STATES

INTRODUCTION

Pursuant to provisions of the National Environmental Policy Act (NEPA), Title 42 United States Code Sections 4331 *et seq.*, implemented by Council on Environmental Quality regulations at Title 40 Code of Federal Regulations (CFR) 1500-1508; U.S. Air Force (USAF) regulations at 32 CFR 989, *Environmental Impact Analysis Process (EIAP)*; Air Force Instruction 32-1015, *Integrated Installation Planning*; and Air Force Manual (AFMAN) 32-7003, *Environmental Conservation*, USAF assessed the potential environmental consequences associated with implementing four individual installation development projects at Wake Island Airfield (WIA), United States. The Environmental Assessment (EA), incorporated by reference into this finding, presents the analysis of potential environmental consequences of activities associated with the Proposed Action, and provides environmental protection measures to avoid or reduce adverse environmental impacts.

PURPOSE

The purpose of the Proposed Action is to provide infrastructure and functionality improvements necessary to support the mission of the Pacific Air Forces (PACAF) Regional Support Center (PRSC), 11th Air Force, by optimizing infrastructure and improving housing to support the 2023 Air Force Installation and Mission Support Center (AFIMSC) Strategic Plan, which aims to revolutionize combat power and installation support for Airmen, Guardians, and their families at every Air Force and Space Force installation by implementing four lines of effort (LOEs), each with a set of related goals.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

PRSC has identified four installation development projects and associated utility, road, sidewalk, parking, and site improvements. All reasonable alternatives were considered during the development of construction, demolition, and renovation associated with these projects, to include status quo, addition/alteration, and new construction.

1. Construct Consolidated Base Support Facility (CSF)
2. Construct New Base Operations (Base Ops) Facility
3. Construct New Base Living Quarters
4. Construct New Aircraft Parking Apron

Construction would disturb approximately 61 acres and would increase the total impermeable surface on the installation by approximately 0.69 acres. Project implementation would begin in fiscal year 2027.

Each project alternative was evaluated based on three selection standards (Section 2.2). Alternative 1 (the Preferred Alternative) met the three selection standards and was considered reasonable; therefore, it has been retained for further consideration in the EA. Alternatives 2 and 3 did not meet one or more of the selection standards and were considered unreasonable; therefore, they were not retained for further consideration in the EA.

- Alternative 1: Preferred Alternative
- Alternative 2: Construct New Base Operations Facility at Its Present Location and New Consolidated Base Support Facility and Base Living Quarters on Peale Island
- Alternative 3: Repair All Buildings to Acceptable Standards

This EA evaluates the potential environmental consequences of implementing the Proposed Action (the Preferred Alternative) and the No Action Alternative. Under the No Action Alternative, no demolition or new construction would occur. The installation would not be able to meet the objectives of the AFIMSC Strategic Plan or USAF's strategic initiative to maximize long-term capabilities in a manner that best meets the ongoing mission needs and future development planning to "provide consistent air surveillance, airfield operations, and base operations support throughout Alaska, Hawaiʻi, and Wake Island." Existing infrastructure would continue trending into disrepair, posing safety and health risks to military and civilian personnel. Rogue waves and storm surges would continue to flood portions of the island and degrade infrastructure. The availability of adequate housing for transient and permanent party personnel would continue to decrease, necessitating procurement of temporary housing. The parking apron would not be expanded, and the air traffic control room would remain non-compliant with safety regulations because of its obstructed view of airfield facilities, including the runway. Existing facilities would be unable to accommodate a surge in aircraft on the island or provide additional space for aircraft parking, taxiing, and overall use of the tarmac.

The No Action Alternative does not support the LOEs in the Strategic Plan, nor does it resolve the increasingly critical building integrity and safety issues currently faced at Wake Island and would not meet the purpose of and need for the Proposed Action.

PREFERRED ALTERNATIVE

Demolition of existing buildings and construction of new buildings and a new aircraft parking apron was an alternative considered reasonable and retained as the Preferred Alternative because it meets the three established selection standards. Under the Preferred Alternative, the following projects would occur:

1. A new CSF would be constructed at the former golf course north of WIA, to include a standalone dining facility (DFAC) with centralized dry and cold food storage areas as well as kitchen and serving areas; and separate consolidated facility that includes a fitness center, medical clinic, billeting office, and base laundry. The project would involve demolition of the existing base laundry facility, DFAC, cold storage facilities, and dormitory/physical fitness center, as well as a former golf course clubhouse.
2. The existing Base Ops Facility would be demolished and a new Base Ops Facility would be constructed approximately 175 feet east and 300 feet north of the existing facility, to include an associated passenger terminal, USAF and non-USAF administration offices, a postal service center, bank counter, secure areas, air traffic control tower, and a personally owned vehicle parking lot.
3. The existing lodging facilities, which consist of consist of dormitories, duplexes, an open bay facility, and tents, would be demolished and new Base Living Quarters would be constructed adjacent to the new CSF in the area of the former golf course.
4. A new 1,100,000-square-foot parking apron would provide space for additional aircraft. The project would demolish a former post-World War II aircraft parking apron (including all structures currently located in the project area) located immediately north of the existing parking apron. The existing taxilane at the airfield would be rebuilt and realigned to ensure adequate wingtip clearance for aircraft. Additionally, Wake Avenue would be realigned to accommodate the new

parking apron, which would involve demolition of water pump stations, warehouses, maintenance and repair shops, fuel labs, an abandoned facility, a former fire station, an administrative building, and the existing Aircraft Rescue and Fire Fighting Station (to be replaced north of the new Base Ops Facility).

SUMMARY OF FINDINGS

USAF has concluded that under the implementation of the Proposed Action there would be no significant adverse impacts to the following resources: Air Installations Compatible Use Zones (AICUZ), land use, noise, air quality, safety and occupational health, hazardous materials and hazardous waste, natural resources, earth resources, socioeconomic resources and environmental justice, and infrastructure and utilities. No significant cumulative impacts would result from activities associated with the Proposed Action when considered with past, present, or reasonably foreseeable future actions at WIA. USAF would adhere to all established environmental protection measures, best management practices, regulations, plans, and programs in the execution of the Proposed Action.

In addition, USAF evaluated potential impacts to water resources and biological resources, and after detailed analysis and coordination with the appropriate agencies, USAF determined that there would be no significant adverse impacts to these resources as a result of the Proposed Action. Pursuant to Executive Order (EO) 11990, *Protection of Wetlands* (including swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds per Section 6[c]), USAF published early notice that the Proposed Action would overlap a 4,700-square foot pond that is connected to Waters of the United States (WOTUS) in the newspaper of record (*The Honolulu Star-Advertiser*) on 29 April 2024. The notice identified state and federal regulatory agencies with special expertise that had been contacted and solicited public comment on the Proposed Action and practicable alternatives. The comment period for public and agency input ended on 29 May 2024. No public comments were received. USAF consulted with the National Oceanic and Atmospheric Administration-National Marine Fisheries Service pursuant to the Marine Mammal Protection Act, the Magnuson-Stevens Fishery Conservation and Management Act, and Section 7 of the Endangered Species Act; and coordinated with the U.S. Fish and Wildlife Service pursuant to the provisions of the Migratory Bird Treaty Act. Consultation correspondence is presented in Appendix A of the EA.

The proposed construction of the new CSF, Base Ops, and Base Living Quarters would impact Building (B) 1502, the existing Base Ops facility; Japanese Bunker WK-48; Japanese Bunker WK-49; U.S. Marine Memorial WK-06; Guam Memorial WK-07; Morrison-Knudson Memorial WK-08; and Japanese Memorial WK-09, all of which are either historic properties and contributing elements to the Wake Island National Historic Landmark or have not been evaluated and are being treated as historic properties. Project impacts to these structures would constitute an adverse effect under Section 106 of the National Historic Preservation Act and its implementing regulation, 36 CFR 800. Per 36 CFR 800.6, the finding of “Historic Properties Affected” would be mitigated according to the terms of a Memorandum of Agreement (MOA) between USAF and the Alaska State Historic Preservation Officer, the National Park Service, and the Advisory Council on Historic Preservation, thereby reducing the impact to less than significant. The MOA is presented in Appendix A of the EA. As part of the MOA mitigation stipulations, USAF anticipates minimizing adverse impacts on memorials WK-06, WK-07, WK-08, and WK-09 by permanently relocating the memorials to areas in front of the new Base Ops Facility. This would entail disassembling the memorials prior to project execution, then reconstructing them in an identical manner in front of the new Base Ops Facility, to be integrated with the new lawn, garden, and architectural layout of the new building. USAF remains responsible for ensuring successful implementation of these mitigations.

CONCLUSION

FINDING OF NO PRACTICABLE ALTERNATIVE

EO 11990 requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct and indirect support of new construction in wetlands wherever there is a practicable alternative. If it is found that there is no practicable alternative, the agency must minimize the destruction, loss, or degradation of wetlands and circulate a notice explaining why the action is to be located in a wetland prior to taking action. In accordance with EO 11990, a FONPA must accompany the FONSI stating why there are no practicable alternatives to development within or affecting wetlands.

A wetland delineation was conducted in March 2023 to determine the presence or absence of wetlands in a 1,190.1-acre study area that encompasses the eastern side of Wake Island from Peacock Point to Downtown (Figure 3.4-1). The footprint of each project associated with the Proposed Action was contained within the wetland study area. Wetlands make up 1.4% (16.8 acres) of the study area. No wetlands identified in the study area geographically overlap the footprints of projects associated with the Proposed Action. Seven ponds make up 0.6% (7.6 acres) of the study area, including the 0.11-acre Pond 5, which is within the footprint of the proposed parking apron. Pond 5 is connected via culverts to the atoll's lagoon, a traditional navigable water under the Clean Water Act (CWA) definition of WOTUS subject to U.S. Army Corps of Engineers (USACE) regulatory jurisdiction.

The proposed new parking apron must be adjacent to the airfield and be able to tie into existing utilities for aircraft fueling operations. There is limited suitable space for development on Wake Island, especially on the south side of the island where the airfield is located. As such, there are no practicable alternatives to siting the project in an area containing WOTUS subject to the requirements of EO 11990. Prior to project implementation, USAF would obtain a USACE general permit in accordance with Section 404 of the CWA and Section 10 of the Rivers and Harbors Act from USACE Honolulu District and ensure the project meets all applicable terms and conditions, including the regional conditions specific to Honolulu District.

Pursuant to EO 11990 and information presented in the EA, there is no practicable alternative to the Preferred Alternative, and the Proposed Action includes all practicable measures to minimize harm to the environment. This finding fulfills the requirements of the referenced EO and 32 CFR 989 for a FONPA.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and analysis in the attached EA, I conclude that the Proposed Action will not have a significant impact either by itself or considering cumulative impacts. Accordingly, the requirements of the NEPA, 40 CFR 1500-1508, and 32 CFR 989 *et seq*. have been fulfilled, and an Environmental Impact Statement is not necessary and will not be prepared. The signing of this FONSI completes the environmental impact analysis process.

Signature to be provided with final version

SIGNATORY NAME RANK TITLE	DATE

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ACRONYMS AND ABBREVIATIONS

%	percent
AASHTO	American Association of Highway and Transportation Officials
ABA	Architectural Barriers Act
ACAM	Air Conformity Applicability Model
ACM	asbestos-containing material
ADP	Area Development Plan
AFF	Air Force Form
AFFF	aqueous film-forming foam
AFI	Air Force Instruction
AFIMSC	Air Force Installation and Mission Support Center
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety, Fire, and Health
AGE	aerospace ground equipment
AICUZ	Air Installation Compatible Use Zone
amsl	above mean sea level
APE	Area of Potential Effect
AQ	air quality
ARTCC	Air Route Traffic Control Center
ASRC	Arctic Slope Regional Corporation
AT/FP	Antiterrorism/Force Protection
B	Building
B.A.	Bachelor of Arts
B.E.	Bachelor of Engineering
B.S.	Bachelor of Science
Base Ops	Base Operations
BASH	Bird/Wildlife Aircraft Strike Hazard
bbls	barrels
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BOS	Base Operations Support
CAA	Clean Air Act
CEIE	Civil, Environmental and Infrastructure Engineering Element
CEP	Certified Environmental Professional
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CES	Civil Engineer Squadron
CFR	Code of Federal Regulations
CGP	Construction General Permit
CH_4	methane

ACRONYMS AND ABBREVIATIONS (CONTINUED)

CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRS	Congressional Research Service
CSF	Consolidated Base Support Facility
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibels
dBA	A-weighted decibels
DERP	Defense Environmental Restoration Program
DET	detachment
DFAC	dining facility
DNL	Day-Night Sound Level
DoD	Department of Defense
DOI	Department of the Interior
DOPAA	Description of Proposed Action and Alternatives
DV	distinguished visitor
EA	Environmental Assessment
EFH	essential fish habitat
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
FY	fiscal year
gal	gallon
GHG	greenhouse gas
GIS	geographic information systems
GWP	global warming potential
HCP	hot cargo pads
HMU	habitat management unit
HVAC	heating, ventilation, and air conditioning

ACRONYMS AND ABBREVIATIONS (CONTINUED)

HWMP	Hazardous Waste Management Plan
IDP	Installation Development Plan
INRMP	Integrated Natural Resource Management Plan
IRP	Installation Restoration Program
JO	Job Order
JP	jet propellant
kW	kilowatts
LBP	lead-based paint
LID	low impact development
L_{max}	maximum A-weighted sound level associated with a given event
LOE	line of effort
LORAN	long-range navigation
LSD	low-sulfur diesel
LUC	land use control
M	million
M.A.	Master of Arts
M.P.A.	Master of Public Affairs
M.S.	Master of Science
MBTA	Migratory Bird Treaty Act
MDA	Missile Defense Agency
MEC	munitions and explosives of concern
MMPA	Marine Mammal Protection Act
MOGAS	motor gasoline
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSGP	Multi-Sector General Permit
MUS	management unit species
N/A	not applicable
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAVAIDS	navigational aids
NCO	non-commissioned officer
NEPA	National Environmental Policy Act
NH_3	ammonia
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NLAA	not likely to adversely affect
NMFS	National Marine Fisheries Service
No.	Number
NO_2	nitrogen dioxide

ACRONYMS AND ABBREVIATIONS (CONTINUED)

NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O_3	ozone
ONMS	Office of National Marine Sanctuaries
OSHA	Occupational Safety and Health Administration
PACAF	Pacific Air Force
PAH	polycyclic aromatic hydrocarbon
Pan Am	Pan American Airways, Inc.
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PJD	preliminary jurisdictional determination
PM_{10}	particulate matter less than 10 micrometers in aerodynamic diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in aerodynamic diameter
POL	petroleum, oil, and lubricants
PPE	personal protective equipment
PRIMNM	Pacific Remote Islands Marine National Monument
PRSC	Pacific Air Forces Regional Support Center
RCNM	Road Construction Noise Model
RCRA	Resource Conservation and Recovery Act
RFFA	reasonably foreseeable future action
ROI	region of influence
ROWPU	Reverse Osmosis Water Purification Unit
RPA	Registered Professional Archaeologist
SAA	satellite accumulation area
SHPO	State Historic Preservation Office/Officer
SO_2	sulfur dioxide
SO_x	sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasures
SWAP	State Wildlife Action Plan
SWPPP	Stormwater Pollution Prevention Plan
TCLP	Toxicity Characteristic and Leaching Procedure

ACRONYMS AND ABBREVIATIONS (CONTINUED)

UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USASMDC	U.S. Army Space and Missile Defense Command
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
VORTAC	Very High Frequency Omnidirectional Range/Tactical Aircraft Control
WIA	Wake Island Airfield
WOTUS	Waters of the U.S.
WS	Wildlife Services
WSA	Wild and Scenic Rivers Act
WWII	World War II
yr	year

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1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

Wake Atoll is approximately 2,000 nautical miles west of Honolulu, Hawaiʻi, and 1,300 nautical miles east of Guam. The atoll is an unincorporated, unorganized territory of the U.S. under administrative control of the U.S. Air Force (USAF) and under installation command authority of the Pacific Air Forces (PACAF) Regional Support Center (PRSC), 11th Air Force, headquartered at Joint Base Elmendorf-Richardson, Alaska. The installation supports contingency deployments, serves as an emergency landing facility, provides fuel storage, and supports the needs of the Department of Defense (DoD). In 1962, Executive Order (EO) 11048 designated the Secretary of the Interior responsible for all executive, legislative, and judicial authority necessary for administration of the atoll. In 1972, a Memorandum of Agreement between USAF and the Department of the Interior (DOI) granted USAF civil administration of the atoll (although ownership stayed with the DOI). PRSC manages the atoll in accordance with the terms and conditions of the 1972 memorandum, with one caveat: on 6 January 2009, Presidential Proclamation 8336 established the Pacific Remote Islands Marine National Monument (PRIMNM), designated to protect areas of the marine environment, and delegated management authority to the Secretary of the Interior (U.S. Fish and Wildlife Service [USFWS]) and the Secretary of Commerce (National Oceanic and Atmospheric Administration [NOAA]); however, Secretary of the Interior Order 3284 maintains that USAF is responsible for civil administration of emergent land on the atoll.

The 2.5-square-mile atoll consists of three coral islands—Peale, Wilkes, and Wake—in a wishbone-shaped formation enclosing a shallow lagoon (Figure 1.1-1). Peale and Wilkes Islands form the northwestern and southwestern portions of the wishbone, respectively, and are uninhabited, though an abandoned U.S. Coast Guard long-range navigation (LORAN) station is present on Peale Island, and a petroleum, oil, and lubricants (POL) storage area is present on the southeastern end of Wilkes Island. Wake Island, the largest of the three islands, forms a "V" shape between Peale and Wilkes Islands. Most development has been on Wake Island, where fewer than 100 USAF personnel (active-duty military members), contractors (independent workers hired by the U.S. government), and employees (civilians employed by USAF) live and work (USAF 2023d). Typical access to Wake Island is gained with prior approval and by aircraft on a flight out of Joint Base Pearl Harbor-Hickam on Oahu, Hawaiʻi. The atoll has no ports; however, it does have a marina that services barges at the southwestern arm of Wake Island. Because of its reefs, the atoll has only two offshore anchorages for large ships.

Four distinct activity areas directly support the operation of Wake Island Airfield (WIA): the airport, the industrial area, Downtown, and the harbor/POL storage area (PRSC 2020). Other areas include the former golf course between the Downtown and industrial areas, and a recycling yard/scrap metal storage area. The Missile Defense Agency (MDA) leases land on the island (Table 1.1-1).

Table 1.1-1 Activity Areas of Wake Island

AREA	LOCATION	INFRASTRUCTURE
Airport	Southern half of Wake Island	The airport consists of a runway, supporting taxiways, a parking apron, an airport terminal, and a communications facility.
Industrial area	Central portion of Wake Island	This area includes the civil engineering building; aviation and airfield maintenance shops; fire and rescue; aircraft refueling support facilities (Area 1500); supply and warehouse buildings; a reverse osmosis water purification plant providing potable water to the island; potable water storage tanks; and warehouse and distribution centers.
Downtown	North of the industrial area	This area supports housing, cafeteria, laundry, medical, retail, and recreational buildings, as well as a power plant and satellite communications facility.
Harbor/POL storage area	Southwestern arm of Wake Island	This area includes docking and warehouse facilities and is connected by a causeway to the bulk fuel/POL storage area (fuel farm) on the southeastern end of Wilkes Island. It also includes Building 1730, a former VORTAC north of the taxiway on the western end of Wake Island.
Other areas	Area between Downtown and the Industrial area	This area contains the remnants of a former golf course. It was once the location of housing, school, and medical facilities for Civil Aeronautics Authority and commercial airline employees, which were removed after the Vietnam refugee airlift of the mid-1970s.
	Southwestern portion of Wake Island	This area includes a recycling yard and scrap metal storage areas.
	MDA area	This area is leased to the MDA, which supports a variety of testing and training mission-related equipment and infrastructure. This area also contains a solid waste accumulation area for the island.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: PRSC 2020; Jacobs 2021a; USAF 2023d.

This Environmental Assessment (EA) was prepared to evaluate the potential environmental impacts associated with construction of a new Base Operations (Base Ops) Facility, aircraft parking apron, Consolidated Base Support Facility (CSF), and Base Living Quarters. This would involve construction of 22 new buildings; demolition of 48 dilapidated Cold War-era buildings and a former aircraft parking apron immediately north of the existing Bravo Apron; relocation of memorials; and rerouting Wake Avenue. Project implementation would begin in fiscal year (FY) 2027.

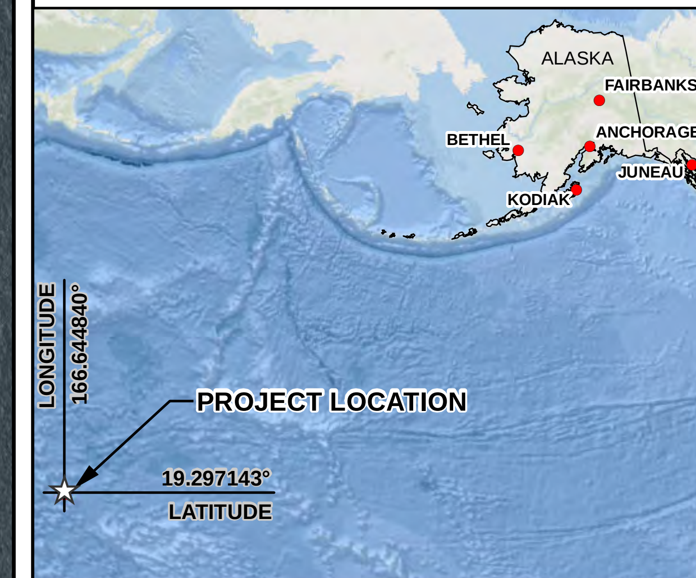
This EA has been prepared by USAF in compliance with the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4331 *et seq.*), the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] 1500-1508), the Air Force Environmental Impact Assessment Process Regulations at 32 CFR 989, Air Force Manual (AFMAN) 32-7003*, Environmental Conservation*, and Air Force Instruction (AFI) 32-1015, *Integrated Installation Planning*.

1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

SITE LOCATION AND VICINITY



Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Main map satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Location map Imagery source: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

2,500 1,250 0 2,500 5,000

Feet

PROJECT No.: 321804	DATE: 7/22/2024	FIGURE: 1.1-1
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The information presented in this document will serve as the basis for deciding whether the Proposed Action would result in a significant impact to the human environment, requiring the preparation of an Environmental Impact Statement (EIS), or whether no significant impacts would occur, in which case a Finding of No Significant Impact (FONSI) would be appropriate. If the execution of any of the Proposed Action would involve "construction" in a wetland as defined in EO 11990, Protection of Wetlands, or "action" in a floodplain under EO 11988, Floodplain Management, then a Finding of No Practicable Alternative would be prepared in conjunction with the FONSI.

1.2 Background

Since the U.S. established formal possession of Wake Atoll in 1899, the atoll has played an important role in pre- and post-World War II (WWII) U.S. history. In the 1930s, Pan American Airways, Inc. (Pan Am) developed the atoll to support its twice-weekly flight service, the first trans-Pacific airline service. In 1941, the atoll was placed under administrative control of the Department of the Navy, and development of Wake Atoll Naval Base began. Shortly thereafter, in 1941, the atoll was attacked by the Japanese, who took possession 2 weeks later. Japanese development on the atoll proceeded until late 1943, when American forces attacked and regained control of the atoll. The Japanese officially surrendered Wake Island to the U.S. on 4 September 1945. The Navy regained operation of the atoll and entered a revocable lease agreement with Pan Am, which resumed regular passenger service through Wake Island in 1946. When the naval air facility was disestablished in 1947, all equipment and facilities were turned over to the Civil Aeronautics Authority. Wake Island became a critical refueling stop for aircraft during the Korean War in the 1950s. Pan Am, along with the Civil Aeronautics Authority and the Military Air Transport Service, airlifted men, supplies, and goods from Wake Island to the Korean front. Following Typhoon Olive in 1952, the Civil Aeronautics Authority built new infrastructure on Wake Island, including a school, passenger terminal, greenhouse, bowling alley, golf course, chapel, bar, softball field, post office, gift shop, and housing. Between 1959 and 1964, the Federal Aviation Administration (FAA) (formerly the Civil Aeronautics Authority) extended the runway to accommodate new jet traffic. During this time, the island's population grew by nearly 500 percent (%), from 349 in 1950 to 1,650 in 1970; however, it began to decline in 1971, reflecting the tapering off of air support operations in the Far East and more long-range, high-efficiency jet aircraft lessening the need for WIA as a refueling stop. USAF currently retains administrative control of Wake Island (PRSC 2020).

Wake Atoll continues to operate as a strategic trans-Pacific refueling stop for military aircraft and supports MDA activities. The goal of installation development at WIA is maximizing long-term capabilities in a manner that best meets the ongoing mission needs and future development planning to effectively carry out the PRSC mission to "provide consistent air surveillance, airfield operations, and base operations support throughout Alaska, Hawaiʻi, and Wake Island" (PRSC 2021a). Implementing the Proposed Action would provide infrastructure and functionality improvements necessary to support the PRSC mission and tenant units by addressing deficiencies of function, capability, and infrastructure.

1.3 Purpose and Need

The purpose of the Proposed Action is to construct a new CSF, Base Ops Facility, Base Living Quarters, and aircraft parking apron at Wake Island that meet USAF safety standards and mission priorities.

The need for the Proposed Action is to optimize infrastructure and improve housing to support the Air Force Installation and Mission Support Center (AFIMSC) *Strategic Plan 2023* (AFIMSC 2023), which aims to revolutionize combat power and installation support for Airmen, Guardians, and their families at every Air Force and Space Force installation by establishing strategic lines of effort (LOEs). Existing facilities on Wake Island were constructed in the 1960s, and the deteriorated buildings are approaching the end of their serviceable lifespan. Problems include failing infrastructure; mold; inadequate internal systems (e.g., heating, ventilation, and air conditioning [HVAC], fire suppression, electrical); and insufficient storage, housing, and office space. The concrete in the buildings is cracking and spalling. In addition, the buildings are located within historical rogue wave and storm surge inundation zones, and do not meet current USAF building and safety standards.

If this action is not implemented, the existing facilities will be unable to adequately support the USAF Strategic Plan. This would result in insufficient and even dangerous working/living conditions for personnel residing on the island and aircraft safety issues.

1.4 Interagency/Intergovernmental Coordination and Consultations

1.4.1 Interagency Coordination and Consultations

Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and identifying significant concerns related to a Proposed Action. Per the requirements of Intergovernmental Cooperation Act of 1968 (42 USC 4231[a]) and EO 12372, Intergovernmental Review of Federal Programs, federal, state, and local agencies with jurisdiction that could be affected by the Proposed Action were notified during the development of this EA.

A list of agencies consulted during this analysis is provided in Table 5-1. Copies of the relevant correspondence are provided in Appendix A.

1.4.2 Government to Government Consultations

Consultation with federally recognized tribes is consistent with the National Historic Preservation Act (NHPA) of 1966 implementing regulations (36 CFR 800); *DoD Instruction 4710.02, Interactions with Federally Recognized Tribes*; *AFI 90-2002, Air Force Interaction with Federally Recognized Tribes*; and *AFMAN 32-7003, Environmental Conservation*. There are no documented Native American Tribes or Native Hawaiian Organizations affiliated with the WIA geographic region. Neither have historically inhabited the atoll, and no evidence exists to indicate that any native groups have ever populated the atoll.

1.4.3 Other Agency Consultations

The environmental analysis process, in compliance with NEPA guidance, includes public and agency review of information pertinent to the Proposed Action and alternatives. Further, compliance with Section 7 of the Endangered Species Act (ESA) and Section 106 of the NHPA require consultation with Services (USFWS and/or NOAA) and the State Historic Preservation Office (SHPO), respectively. While Wake Island is a U.S. Territory, the Alaska SHPO acts as Wake Island's SHPO under a 2009 memorandum of understanding. Federal and state agencies with jurisdiction that could be affected by the alternative actions were notified and consulted during the development of this EA.

A list of agencies consulted during this analysis is provided in Table 5-1. Copies of the relevant correspondence are provided in Appendix A.

1.5 Public and Agency Review of EA

Because the Proposed Action area coincides with Waters of the U.S. (WOTUS), as defined by the U.S. Army Corps of Engineers (USACE), it is subject to the requirements and objectives of EO 11990. USAF published early notice that the Proposed Action would occur in WOTUS in the newspaper of record (the *Honolulu Star-Advertiser*) on 29 April 2024. The notice identified state and federal regulatory agencies with special expertise that have been contacted and solicited public comment on the Proposed Action and any practicable alternatives. The comment period for public and agency input ended on 29 May 2024. No public comments were received.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

This EA evaluates the potential environmental impacts that may arise from construction of a new CSF, Base Ops Facility, Base Living Quarters, and aircraft parking apron, and associated actions at Wake Island. The Proposed Action would result in the following changes:

1. An increase in the available billeting space
2. An increase in the available administration office space
3. An increase in the capacity to accommodate aircraft at WIA
4. Construction and demolition to support increased personnel and operations and to achieve compliance with USAF building standards and FAA safety standards

2.1.1 Aircraft

The existing parking aprons, Alpha and Bravo, are situated at the eastern end of the airfield (USAF 2024a). A former aircraft parking apron developed after WWII is located immediately north of Bravo Apron. The new parking apron project would demolish the former parking apron (approximately 650,000 square feet) and construct a new 1,100,000-square-foot parking apron with space for additional aircraft. Structures within the demolition zone would be removed permanently or replaced (USAF 2022a).

2.1.2 Personnel

WIA is currently staffed by active-duty USAF personnel (PRSC 2020). The new Base Living Quarters would support permanent party and transient personnel. The number of full-time staff occupying Wake Island would not change as a result of the Proposed Action.

2.1.3 Aircraft Operations

The number and frequency of aircraft operations would not change as a result of the Proposed Action. Aircraft operations would occur within existing airspace areas currently used by aircraft landing at WIA. A change in airspace would not be necessary to execute the Proposed Action.

2.1.4 Construction and Demolition

The Proposed Action would have associated construction and demolition projects to provide necessary infrastructure upgrades and remove unusable/unsafe infrastructure. Tables 2.1-1 and 2.1-2 provide a summary of the new construction and demolition projects, respectively, and Figures 2.1-1A through 2.1-1D show the locations of projects under the Proposed Action. The projects would disturb approximately 61 acres, which is the sum of Table 2.1-1 total construction area and Table 2.1-2 total demolition area, minus overlap, and would increase the total impermeable surface on the installation by approximately 0.69 acres. Debris generated from building demolition would be shipped to an approved landfill, except for clean (rebar-free) concrete, which would be stockpiled for future use. Staging would occur at the industrial area north of the new parking apron project area and would generate a temporary area of disturbance of approximately 3.1 acres. The temporary staging would not add to the total impermeable surface on the installation as the area is already paved.

Table 2.1-1 Proposed New Construction Projects

RELATED PROJECTS	AREA OF DISTURBANCE (SQUARE FEET)
CSF	
DFAC	22,778
Fitness center	8,670
Medical clinic	2,261
Billeting office	700
Base laundry	1,615
Generator building #1	450
Generator building #2	450
Picnic pavilion #1	802
Picnic pavilion #2	802
CSF Total	**38,528 (0.88 acre)**
BASE OPS FACILITY	
Base Operations Facility	27,983
Generator building	450
Re-route Wake Avenue	75,520
Base Ops Facility Total	**103,953 (2.39 acres)**
BASE LIVING QUARTERS	
Dorm - Airman Permanent Party #1	30,171
Dorm - Airman Permanent Party #2	30,171
Dorm - Unaccompanied NCO	41,762
DET Staff Duplex #1	1,180
DET Staff Duplex #2	1,180
Company Commander House	1,001
Dorm - Visiting Airman, Short Term #1	17,175
Dorm - Visiting Airman, Short Term #2	17,175
Dorm - Visiting Airman, Short Term #3	17,175
Dorm - Visiting Airman, Long Term	23,015
DV Duplex	1,421
Base Living Quarters Total	**181,426 (4.16 acres)**
AIRCRAFT PARKING APRON	
Aircraft Parking Apron Total	**2,100,000 (48.21 acres)**
Construction Total	**2,423,907 (55.65 acres)**

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: Jacobs 2021b; USAF 2022a.

Table 2.1-2 Proposed Demolition by Project

RELATED DEMOLITION	AREA OF DISTURBANCE (SQUARE FEET)
CSF	
B1103 (base laundry)	3,526
B1104 (DFAC)	8,715

Table 2.1-2 Proposed Demolition by Project

RELATED DEMOLITION	AREA OF DISTURBANCE (SQUARE FEET)
B1105 (cold storage)	2,485
B1107 (cold storage)	1,175
B1128 (dormitory/physical fitness center)	12,917
B2100 (former golf course clubhouse)	1,519
CSF Total	**30,337 (0.70 acre)**
BASE OPS FACILITY	
B106 (former chapel)	2,452
B1502 (existing Base Ops Facility)	17,715
B1503 (generator building)	440
Base Ops Facility Total	**20,607 (0.47 acre)**
BASE LIVING QUARTERS	
B506 (visiting officer's quarters)	2,155
B626 (officer's quarters)	3,063
B921 (airman dormitory)	3,429
B944 (officer's quarters)	3,185
B1009 (Officer's Quarters Station Manager)	2,295
B1010 (officer's quarters)	2,295
B1011 (officer's quarters)	2,295
B1012 (officer's quarters)	2,147
B1013 (officer's quarters)	2,335
B1014 (officer's quarters)	2,148
B1015 (officer's quarters)	2,268
B1016 (officer's quarters)	2,295
B1017 (officer's quarters)	2,980
B1018 (officer's quarters)	2,980
B1115 (visiting officer's quarters)	10,579
B1116 (visiting airman quarters)	6,962
B1117 (airman dormitory)	10,579
B1118 (airman dormitory)	7,131
B1120 (airman dormitory)	7,683
B1128 (visiting airman quarters)	12,918
Base Living Quarters Total	**91,722 (2.11 acres)**
AIRCRAFT PARKING APRON	
Former aircraft parking apron	650,000
*B130 (abandoned facility)	8,923
*B201 (water pump station)	402
*B202 (water pump station)	90
B1401 (base engineer administrative building)	3,313

Table 2.1-2 Proposed Demolition by Project

RELATED DEMOLITION	AREA OF DISTURBANCE (SQUARE FEET)
B1402 (supply warehouse)	25,926
B1403 (vehicle maintenance shop)	9,993
B1406 (vehicle maintenance shop)	4,056
B1408 (base engineer maintenance shop)	6,356
B1409 (base engineer maintenance shop)	4,038
B1410 (base engineer maintenance shop)	2,811
B1411 (engineer repair shop)	1,047
*B1504 (former fire station)	6,895
*B1513 (warehouse)	5,356
*B1514 (air conditioning/refrigeration shop)	4,320
*B1515 (diesel fillstand)	77
B1519 (vehicle maintenance shop)	19,914
*B1522 (current fire station)	9,273
*B1550 (fuel lab)	435
*B1551 (fuel lab)	451
Aircraft Parking Apron Total	**727,454 (16.70 acres)**
Demolition Total	**870,120 (20.00 acres)**

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
*Building within the former aircraft parking apron footprint.
Source: USAF 2022a, 2023e.

2.1.4.1 Consolidated Base Support Facility

A new CSF would be constructed at the former golf course north of WIA, to include a standalone dining facility (DFAC) with centralized dry and cold food storage areas as well as kitchen and serving areas; and separate consolidated facility that includes a fitness center, medical clinic, billeting office, and base laundry. A new generator building housing a new generator would also be constructed, as well as associated utilities, roads, sidewalks, parking, and site improvements. Building (B) 1103 (base laundry), B1104 (DFAC), B1105 (cold storage), B1107 (cold storage), B1128 (dormitory/physical fitness center) and B2100 (former golf course clubhouse) would be demolished.

2.1.4.2 Base Operations Facility

This project would involve demolition of B106 (defunct chapel), B1502 (existing Base Ops Facility), and B1503 (generator building, including the existing generator); and construction of a new facility approximately 175 feet east and 300 feet north of the existing facility, to include an associated passenger terminal, USAF and non-USAF administration offices, a postal service center, bank counter, secure areas, air traffic control tower, and generator building housing a new generator, as well as associated utilities, roads, sidewalks, a personally owned vehicle parking lot, and site improvements. An aerospace ground equipment (AGE) storage area would also be constructed. Memorials would be relocated east of the new facility.

2.1.4.3 *Base Living Quarters*

Existing lodging facilities on Wake Island consist of dormitories, duplexes, an open bay facility, and tents to accommodate population surge. Larger construction contracts provide containerized housing unit facilities for their personnel. Following project implementation, the lodging capacity would decrease by 30%. The existing lodging facilities would be demolished and the new Base Living Quarters would be constructed adjacent to the new CSF in the area of the former golf course (Table 2.1-3).

Table 2.1-3 Housing Breakout

TYPE
Permanent Party
Craftsman
Managers/leads
Detachment staff
Company Commander
Transient
Long-term
Short-term
DV

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: PACAF 2022.

The project includes demolition of 20 buildings that would be excess after construction is complete, including B1115 (visiting officer's quarters), B1116 (visiting airman quarters), B1117 (airman dormitory), B1118 (airman dormitory), and B1120 (airman dormitory).

In anticipation of future housing demand, the Base Living Quarters area would contain enough space to construct two additional two-story dormitories for added housing capacity.

2.1.4.4 *Aircraft Parking Apron*

Construction of a new parking apron would allow WIA to accommodate aircraft with longer wingspans to taxi in and out and would increase the baseline capacity by eight. The existing taxilane at the airfield would be rebuilt and realigned to ensure adequate wingtip clearance for aircraft and provide a seamless, logical extension of Taxilane Alpha (Jacobs 2021a). Wake Avenue would be realigned to accommodate the new parking apron and AGE storage area. This would involve demolition of B130 (abandoned facility), B201 (water pump station), B202 (water pump station), B1401 (base engineering administrative building), B1402 (supply warehouse), B1403 (vehicle maintenance shop), B1406 (vehicle maintenance shop), B1408 (base engineer maintenance shop), B1409 (base engineer maintenance shop), B1410 (base engineer maintenance shop), B1411 (engineer repair shop), B1504 (former fire station), B1513 (warehouse), B1514 (air conditioning/refrigeration shop), B1515 (diesel fill stand), B1519 (vehicle maintenance shop), B1522 (existing Aircraft Rescue and Fire Fighting Station, to be replaced approximately 400 feet north of the new Base Ops Facility), B1550 (Fuel Lab 1), and B1551 (Fuel Lab 2).

2.2 Selection Standards for Alternatives

NEPA and CEQ regulations mandate the consideration of reasonable alternatives for the Proposed Action. "Reasonable alternatives," as defined in 40 CFR 1508, means a reasonable range of alternatives that are technically and economically feasible, meet the purpose of and need for the Proposed Action, and, where applicable, meet the goals of the applicant. Per the requirements of 32 CFR 989, the USAF Environmental Impact Analysis Process (EIAP) regulations, selection standards are used to identify alternatives for meeting the purpose and need for the USAF action.

AFIMSC has developed four LOEs, each with a set of related goals (16 total), to meet strategic and defense priorities to support the organization, the Air and Space Force, and the greater Defense enterprise (AFIMSC 2023). The Proposed Action meets two of these LOEs (one goal per LOE):

1. LOE 1 Goal 1: Optimize Infrastructure
2. LOE 2 Goal 2: Improve Housing for Airmen, Guardians, and Families

To support the PRSC mission while meeting USAF safety criteria, the Proposed Action alternatives must meet the following selection standards:

1. Provide facilities that meet USAF building and safety standards (LOE 1 Goal 1 and LOE 2 Goal 2)
2. Improve the aircraft parking capacity of WIA (LOE 1 Goal 1)
3. Operate an air traffic control tower that satisfies the requirements of FAA JO 7400.2 (LOE 1 Goal 1)

2.3 Detailed Description of Alternatives

The NEPA process is intended to support flexible, informed decision-making; the analysis provided by this EA and feedback from the public and other agencies will inform decisions made about whether, when, and how to execute the Proposed Action. The No Action Alternative will substantively analyze the consequences of not undertaking the Proposed Action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

Action alternatives that met the three selection standards described in Section 2.2 were considered reasonable and are retained for consideration. Alternatives that did not meet one or more of the selection standards were considered unreasonable and are not retained for consideration in the EA.

2.3.1 Alternative 1: Preferred Alternative

The proposed construction and demolition projects are based on the need for infrastructure improvements that satisfy the LOEs described in Section 2.2. Demolition of existing buildings and construction of new buildings and a new aircraft parking apron was an alternative considered reasonable and retained as the Preferred Alternative because it meets the three established selection standards.

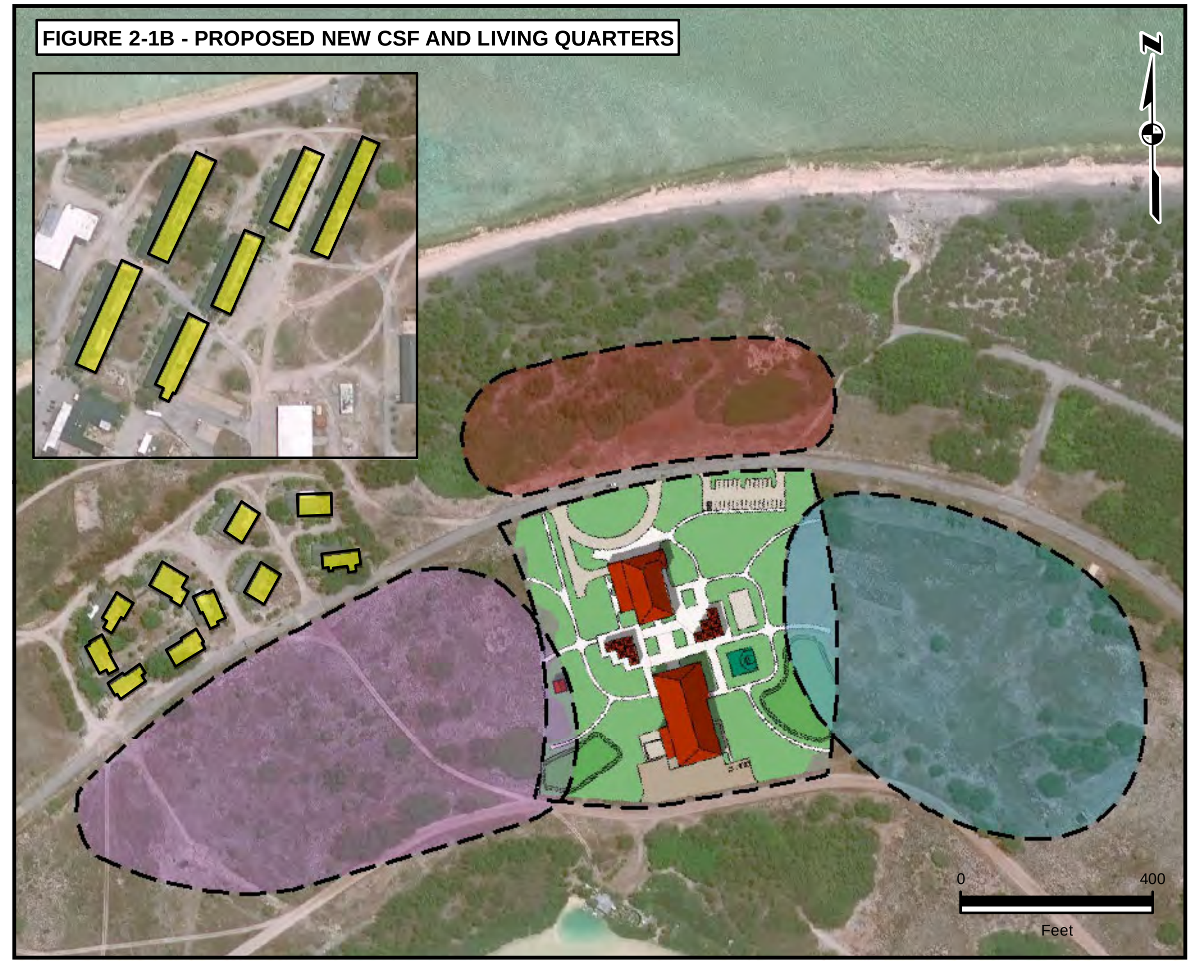
1. Construction of new facilities ensures that current USAF building and safety standards would be met; additionally, the quality of housing would be improved.
2. Construction of a new parking apron would increase the aircraft parking capacity of WIA.
3. Construction of a new air traffic control tower as part of the Base Ops Facility project would bring USAF into compliance with FAA JO 7400.2.

1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED PROJECTS AT WAKE ISLAND



Legend

- Proposed Building
- Proposed PCC HD Pavement
- Proposed PCC MD Pavement
- Proposed PCC LD Pavement
- Proposed PCC Sport Court
- Proposed Sand Surface
- Proposed Disturbed/Cleared Area
- Proposed Stormwater Basin
- Building to be Demolished

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed project features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

PROJECT No.: 321804	DATE: 8/12/2024	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2.1-1A

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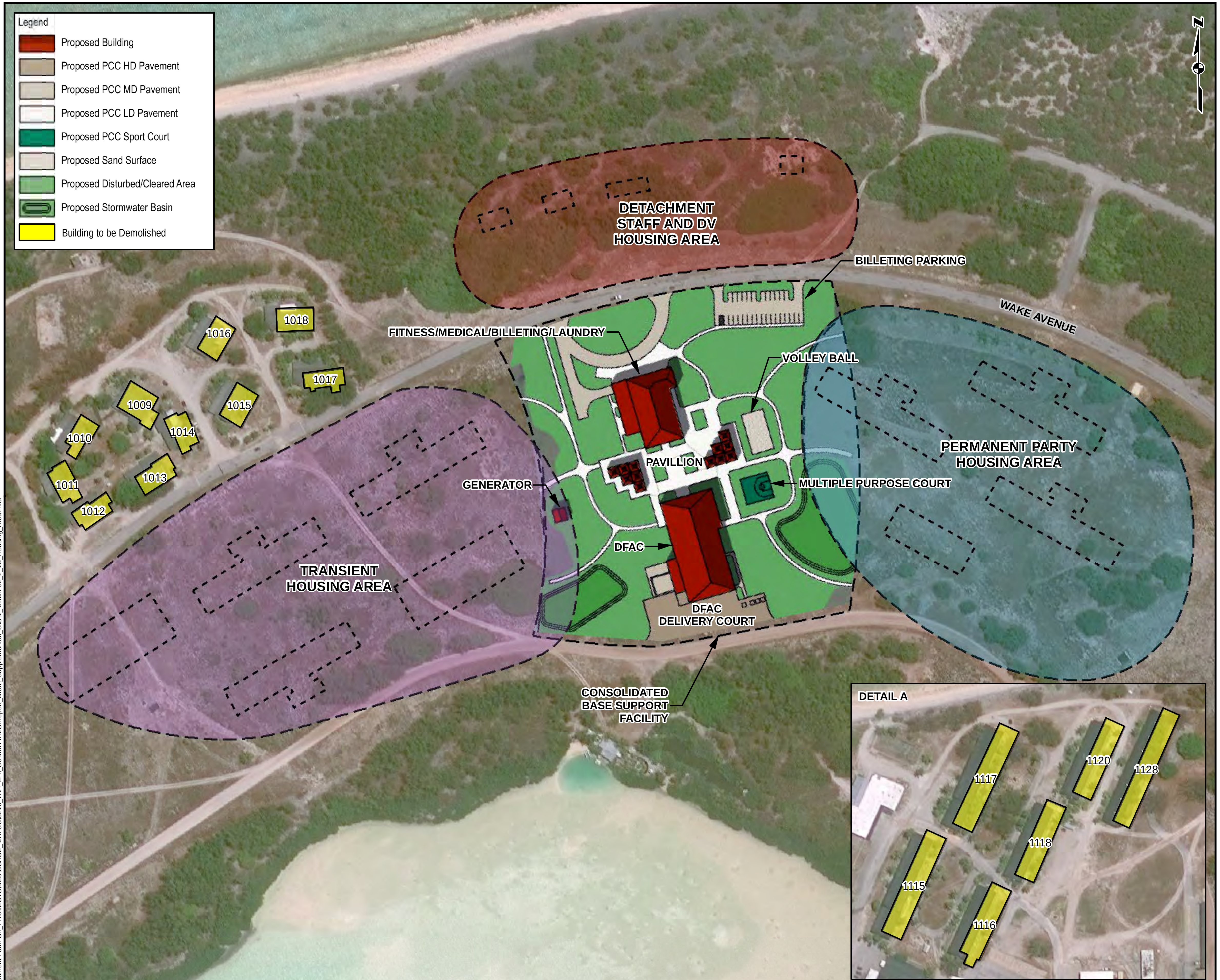

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED NEW CSF AND LIVING QUARTERS

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed CSF and Living Quarters features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.
3. Proposed CSF and Living Quarters features sourced from 611 CES/CEIE. ND. *MILCON Planning Charrette Report II*. Maps prepared by Jacobs Solutions Inc.

WGS 1984 UTM ZONE 4 N, METERS
HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

200 100 0 200 400

Feet

PROJECT No.: 321804	DATE: 8/12/2024	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2.1-1B

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1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED NEW PARKING APRON

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed Parking Apron features sourced from 611 CES/CEIE. ND. *Wake Island Apron PCR Concept 2*. Map prepared by Jacobs Solutions Inc.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

300 150 0 300 600

Feet

PROJECT No.: 321804	DATE: 5/19/2023	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2.1-1C

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1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED BASE OPS FACILITY

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed Base Ops features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONTAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

200 100 0 200 400

Feet

PROJECT No.: 321804	DATE: 6/20/2023	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2.1-1D

Document Path: G:_PROJECTS\BES\USACE_MATOC\3218_WIA_EA_SUBMITTALS\Report_Draft_Supplemental_GIS\1_MXD\F02_1_1D_Base_Ops.mxd

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Based on the above criteria, construction of new buildings and demolition of existing buildings was the only alternative determined to reasonably fulfill all three selection standards. Under the Preferred Alternative, the CSF and Base Living Quarters would be relocated outside the rogue wave and storm surge inundation zones to the extent possible; the existing Base Ops Facility would be replaced by a larger facility with more administrative space and support functions to optimize existing demand; existing dated infrastructure on Wake Island would be removed; and the aircraft parking capacity of WIA would be improved. The four projects under the Preferred Alternative would require a number of related projects, as described in Sections 2.1.4.1, 2.1.4.2, 2.1.4.3, and 2.1.4.4, and would provide necessary space for the equipment, supplies, and incoming personnel needed to maintain and manage increased operations.

2.3.2 Alternative 2: Construct New Base Operations Facility at Its Present Location and New Consolidated Base Support Facility and Base Living Quarters on Peale Island

Under Alternative 2, the new Base Ops Facility would be constructed in its current location and the new CSF and Base Living Quarters would be constructed on Peale Island. This would require construction of a bridge, because there is not currently a bridge to Peale Island, as well as installation of new utility lines. Peale Island contains a number of sensitive cultural resources such as Japanese defensive positions, Japanese base facilities, U.S. Naval Air Station facilities, and remains from the Pan Am air station that are contributing elements to the Wake Atoll National Historic Landmark (NHL). The island is also currently being considered as a relocation site for birds residing on Wilkes Island, which pose a strike hazard for aircraft due to Wilkes' proximity to WIA.

2.3.3 Alternative 3: Repair All Buildings to Acceptable Standards

Under Alternative 3, no new buildings would be constructed; instead, existing buildings would be repaired in-kind. This would require extensive and cost-ineffective repairs to spalling concrete, failing electrical and HVAC systems, fixtures, and windows/doors. Most, if not all the buildings would also require mold removal. Even if the repairs were completed, the structures are inadequate to support the existing residents and operations at Wake Island: The existing Base Ops Facility has a lifespan of 2 to 3 years; if structural reinforcements were implemented, the building's lifespan would be extended by 7 to 10 years. At the existing CSF, the DFAC is undersized and does not contain adequate seating room or space for food storage and preparation, and the medical clinic does not have space for a garage. The current Base Living Quarters are deteriorating due to premature failure of concrete and metal corrosion resulting from the high ambient salinity, and do not have the capacity to house additional personnel. Additionally, all the existing housing and CSF facilities are located in the rogue wave and storm surge inundation zone.

2.3.4 No Action Alternative

Under the No Action Alternative, Wake Island would retain its existing infrastructure with no changes. Facility construction and demolition would not occur. The No Action Alternative does not support the LOEs in the Strategic Plan; nor does it resolve the increasingly critical building integrity and safety issues currently faced at Wake Island. The No Action Alternative would not meet the purpose of and need for the Proposed Action as described in Section 1.3.

2.4 Alternatives Eliminated from Further Consideration

All of the alternatives except for the Preferred Alternative and No Action Alternative were eliminated from further consideration because they do not meet all of the selection standards described in Section 2.2. Alternative 2 (Section 2.3.2) would not optimize infrastructure, as there are no existing roads or utility lines capable of servicing Peale Island; Alternative 3 (Section 2.3.3) would neither optimize infrastructure nor bring the air traffic control tower into compliance with FAA JO 7400.2 as outlined in Selection Standards 1 and 3; and the No Action Alternative would not meet any of the selection standards. Only the Preferred Alternative meets all three selection standards.

All reasonable alternatives were considered during the development of associated construction and demolition projects, to include status quo, in-kind repairs, and new construction/demolition of old buildings.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Scope of the Analysis

In compliance with NEPA, CEQ, and EIAP (32 CFR 989) guidelines, this chapter describes the current conditions of the environmental resources, human-made or natural, that would be affected by the Proposed Action or the No Action Alternative. All potentially relevant resource areas were considered for analysis. Depending on the resource area, the extent of the affected environment/region of influence (ROI) may differ. Unless otherwise noted, the extent of the affected environment/ROI is as follows (Figures 1.1-1 and 2.1-1A to 2.1-1D):

4. The former golf course area northeast of Downtown where the proposed new CSF and Base Living Quarters would be constructed
5. The portion of the industrial area where the proposed new parking apron would be constructed
6. The portion of the airport area where the proposed new Base Ops Facility would be constructed
7. The portion of Downtown where buildings would be demolished as part of the Base Living Quarters project

Unless otherwise defined, Table 3.1-1 presents definitions for descriptors used to indicate the degree of impacts on resource areas analyzed in this EA.

Table 3.1-1 Environmental Consequences Descriptors

CATEGORY	DESCRIPTOR	DEFINITION
Type	Direct	Direct impacts are caused by an action and occur at the same time and place as the action.
	Indirect	Indirect impacts are caused by the action and occur later in time or are farther removed from the place of impact but are reasonably foreseeable.
	Cumulative	Incremental impacts of the action with past, present, and RFFAs. Refer to Section 3.1.1.
Context	The resource area(s) being impacted and the corresponding ROI.	
Duration	Short-term	Impacts with temporary effects.
	Long-term	Impacts with permanent effects.
Intensity	Negligible	The impact is localized and not measurable, or at the lowest level of detection.
	Minor	The impact is localized and slight, but detectable.
	Moderate	The impact is readily apparent and appreciable.
	Substantial	The impact is large and highly noticeable.
	Significant	Significance indicators are defined in the Environmental Consequences subsection for each individual resource area.
Nature	Adverse	A negatively perceived or undesirable effect on the human or natural environment; the effect may violate an existing environmental regulation or cause a deterioration of the baseline environmental quality.
	Beneficial	A desirable or positive effect on the human or natural environment; the effect may bring a condition closer to achieving compliance with existing environmental regulations or create efficiencies in resource area use.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.

3.1.1 Cumulative Impacts Analysis

As defined in 40 CFR 1508.7, cumulative impacts on the environment are those that result from the incremental impact of the action and other past, present, and reasonably foreseeable future actions (RFFAs) 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 time. The following USAF-led projects/actions were identified as relevant for the cumulative impacts analysis (Table 3.1-2). No relevant projects led by other agencies or persons were identified in the ROI.

Table 3.1-2 Past, Present, and Reasonably Foreseeable Projects for Cumulative Impacts Analysis

PROJECT	DESCRIPTION AND RATIONALE	TIMELINE
Repair by Replacement ROWPUs (B1303)	The ROWPUs are not being maintained for maximum efficiency and cannot sustain a surge population. Replacing the existing units will increase the capacity. Two ROWPU units were replaced and a third unit was installed.	Past activities
Repair Sanitary Sewer System	The system is in poor and failing condition. Lift stations are susceptible to typhoons and maintenance personnel are exposed to the asbestos-containing main. Upgrades and repairs would likely occur concurrently with nearby construction projects so utilities could hook up or tie into new facilities.	FY2021
Repair Wake Island Roads	The pavement has failed and is well past its service life and continuous maintenance is required. Minor repairs are ineffective. The sections of road considered for repair have not been determined and would be evaluated as other foreseeable projects are designed.	FY2022
Demolish Storage Facility (B1406)	The building's metal walls were ripped off during storms. The building is currently cordoned off as most of the building's materials contain ACM or LBP, it is not structurally sound, and it is unsafe.	FY2022
Demolish Hazmat Storage (B400)	The building is no longer structurally sound and is beyond repair. All systems have failed, and the building likely contains hazardous materials.	FY2022
Demolish Storage Facility (B1407)	The structure is beyond its useful life; not structurally sound; and unsafe. It is cordoned off because most of the building materials contain ACM or LBP, making it a safety hazard. The storage facility would be demolished following established USAF standards and protocols currently practiced on the island. Any salvageable demolition debris (e.g., usable concrete) would be segregated for reuse, and the remaining debris would be hauled to the waste accumulation area for eventual disposal via barge transfer.	FY2023
Temporarily Replace Facilities with Prefabricated Structures for Warehouse Space	Warehouse space is lacking on island. This project will temporarily replace Buildings 1406 and 1407 with prefabricated storage buildings.	FY2023
Repair Alpha Aprons and Taxiways Alpha, Bravo, Charlie, Delta, Echo	Repairs are needed to prevent further damage to the aprons and extend the useful life of the pavement.	FY2023
Demolish Former Air Traffic Control Tower (B1601)	The building has suffered severe typhoon damage. It is no longer structurally sound and is unsafe. It is cordoned off because most of the building materials contain ACM or LBP, making it a safety hazard. The tower would be demolished following established USAF standards and protocols currently practiced on the island. Any salvageable demolition debris (e.g., usable concrete) would be segregated for reuse and the remaining debris would be hauled to the waste accumulation area for eventual disposal via barge transfer.	FY2023

Table 3.1-2 Past, Present, and Reasonably Foreseeable Projects for Cumulative Impacts Analysis

PROJECT	DESCRIPTION AND RATIONALE	TIMELINE
Repair by Replacement Plumbing Shop (B1304)	This 1953 building is a safety hazard due to wood rot and termite damage. The doors are non-functional and are blocked off.	FY2024
Repair Concrete Walls of Heavy Equip Shop (B1519)	Concrete in the building is spalling, creating a safety hazard, and the main entrances are unsafe to enter due to the possibility of failing concrete or building collapse. Both entrances have been cordoned off, creating evacuation issues in the event of a fire.	FY2024
Install New Vehicle Wash Rack	The current vehicle wash area is not sized for the vehicles it services and it does not meet regulatory requirements, as it lacks items such as wash water containment, sedimentation basin, oil and water separator, and sludge removal. This is a critical facility in the highly corrosive environment.	FY2024
Repair Electrical Distribution, Industrial Area	Electrical distribution cable is deteriorating and beyond its useful life. Critical facilities may lose power.	FY2025
Repair Chapel (B1181)	The building extension off the back of the chapel has structurally failed from water and termite damage; the side extension has asbestos-containing floor tile; and the main structure has significant spalling on all walls.	FY2025
Repair Well Pump Houses (B1308, 1309)	Existing pump houses are in poor condition and require structural repairs.	FY2025
Demolish Electrical Power Building (B950)	The building was constructed in 1962 and is beyond its useful life; it is no longer structurally sound and is beyond repair. All systems have failed, and the building likely contains hazardous materials.	FY2025
Demolish Storage Facility (B952)	The building was constructed in 1959 and is beyond its useful life; it is no longer structurally sound and is beyond repair. All systems have failed, and the building is overgrown with vegetation. Additionally, it likely contains hazardous materials.	FY2025
Repair or Replace Petrol Ops Office (B1509)	This 1970 building has extensive termite damage. The concrete walls are experiencing delamination and rebar degradation. B1509 may be replaced with either B1550 or B1551, which appear to be portable facilities that could be relocated.	FY2026
Replace Bridge to Peale Island (dependent on rat eradication)	The existing bridge burned down in 2003. Currently, the only way to transport anything from Wake Island to Peale Island is by water.	FY2026
Construct Running Path	Roads are currently used as running paths. The roads are uneven, unlit, and dangerous due to the proximity of runners to vehicle traffic.	FY2026
Improve Harbor and Fuel Pier	Fuel is currently offloaded at two offshore mooring buoys. This significantly increases the risk of a spill or accident. The harbor is too narrow and shallow for large seagoing vessels to enter. This increases the labor, time, risk, and cost of every shipment to and from the island.	FY2026
New Storage/Warehouse Facility	The current warehouses and maintenance facilities are in advanced states of failure, from structural damage to exterior cracking. Warehouses space is becoming scarce due to failed facilities. The construction would replace B1406, B1407, B1409, and B1403 (buildings planned for demolition under the Proposed Action). The facility would be built in compliance with current USAF construction standards.	FY2027
Bulk Fuel Tank Addition	There is potential for the addition of up to three bulk fuel storage tanks. Fuel supply would be used for base housing and Navy refueling.	FY2027

Table 3.1-2 Past, Present, and Reasonably Foreseeable Projects for Cumulative Impacts Analysis

PROJECT	DESCRIPTION AND RATIONALE	TIMELINE
Remove Invasive Ironwood	Removal of ironwood from three areas on WIA through a combination of chainsaw, herbicide application, controlled burn, and/or removal by heavy equipment. Disposal would also be carried out by various methods including wood-chipper, controlled wood pile burn, or in-situ controlled burn. As of March 2024, 4 acres of ironwood have been removed. An additional 66 acres may be removed under future contracts.	TBD

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: Jacobs 2021a; PRSC 2021a.

3.2 Air Installations Compatible Use Zones/Land Use/Noise

3.2.1 Definition of Resource

3.2.1.1 AICUZ

The Air Installation Compatible Use Zones (AICUZ) Program was established by DoD as a direct response to the Noise Control Act of 1972 to promote compatible land use patterns around air installations and decrease the effects of noise on public health and welfare. The AICUZ Program also protects DoD airfields from encroachment and incompatible land use while balancing the need for aircraft operations with community concerns. USAF installations are required to develop, implement, and maintain AICUZ programs per AFI 32-1015 (USAF 2019a). These programs define procedures where aircraft operations may affect public health and safety, or where certain uses or structures may obstruct the airspace, attract birds, create electromagnetic or thermal interference, or impact a pilot's vision as a result of dust, smoke, steam, or light emissions, thereby creating hazards incompatible with aircraft operations. They also define areas with higher risk of accidents, high noise exposure, and recommended land uses (Pacific Air Forces Regional Support Center [PRSC] 2022).

The Wake Atoll Installation Development Plan (IDP) is a master planning document that evaluates the island's existing buildings and infrastructure as well as the airfield's mission requirements to designate and efficiently use the available land. The information is used to define the context of development on the installation including compatible use considerations (PRSC 2021a).

3.2.1.2 Land Use

Land use generally refers to the management and use of lands by people, including land ownership, status, and consistency with the land management plans and ordinances in effect to limit conflicting land uses and ensure protection of specially designated or environmentally sensitive areas. Natural land conditions are described as unimproved, undeveloped, conservation or preservation areas, and natural or scenic areas. Anthropogenic land uses are commonly characterized as those consistent with residential, commercial, recreational, agricultural, industrial, or institutional activities.

3.2.1.3 Noise

Sound can be defined as a physical phenomenon consisting of vibrations that travel through a medium, such as air. The auditory effect is sensed by the human ear, which responds to increased sound levels according to the type, characteristics of the source, distance, receptor sensitivity, and time of day

(PRSC 2022). Noise is defined as any sound that is undesirable, intrusive, or intense enough to cause hearing damage. Noise sources and frequencies can be inconsistent or constant, and steady or sporadic. Proper noise analysis requires assessing a combination of physical measurements of sound and physical, physiological, psycho-acoustic, and socio-acoustic effects. Noise analysis typically evaluates potential changes to the existing noise environments that would result from implementing the Proposed Action and alternative(s). Noise may affect wildlife and green spaces through disruption of nesting, foraging, migration, and other life-cycle activities or human environments such as schools, hospitals, or residential areas. Noise in the surrounding airspace would be attributed to incoming and outgoing air traffic from passenger and cargo aircraft, fighter squadrons, and aerial training exercises.

In accordance with Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*, 65 A-weighted decibels (dBA) Day-Night Sound Level (DNL) is the noise level below which generally all land uses are compatible with the noise from aircraft operations. Areas below 65 dBA DNL may also experience levels of appreciable noise, depending on training intensity or weather conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational tempo because of unit deployments, funding levels, and other factors. Noise metrics are described in Table 3.2-1.

Table 3.2-1 Noise Metrics

NOISE METRIC	ABBREVIATION	DEFINITION
Day-Night Sound Level	DNL	The average sound energy in a 24-hour period with a penalty added to the nighttime levels. When calculating DNL, noise events between 10:00 p.m. and 7:00 a.m. are assessed with a 10-dB penalty.
Maximum Sound Level	L_{max}	The root mean squared maximum level of a noise source.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.

3.2.2 Affected Environment

3.2.2.1 AICUZ

The affected environment for the AICUZ analysis is the WIA, which is located on the southern half of Wake Island. The airfield's mission is multi-faceted, serving as an emergency divert airfield, a refueling station for trans-Pacific stopover traffic, and a testing location for the MDA (Jacobs 2021a). Lighting and navigational aids (NAVAIDS) directing air traffic include high-intensity runway edge lights, runway end-identifier lights, a rotating beacon, directional signage, and precision approach indicators; however, full instrument landing systems are unavailable for aircraft using WIA airspace (Jacobs 2021a). Operations are limited due to the length of the runway and an inability to accommodate higher volumes of traffic. WIA airspace receives infrequent arrivals and departures of passenger and cargo flights transporting support personnel and supplies to and from the island. The PACAF seeks to expand its existing airfield and airspace capabilities to alleviate these operational limitations.

Wake Island serves as an aircraft refueling station for USAF, U.S. Marine Corps, and U.S. Navy Trans-Pacific (Trans-Pacs) aircraft (PRSC 2021a). A mixed fleet of aircraft may be found at the airfield at a given time. Flights occur only in Wake Island's airspace. The airspace surrounding the atoll is Class G uncontrolled airspace up to 5,500 feet and managed by the FAA Oakland Air Route Traffic Control Center (ARTCC) (USAF 2023c, 2024).

Land use controls (LUCs) are in effect to restrict development near parking aprons and runways and to protect personnel and facilities on the atoll by ensuring compatibility with aircraft operations on the ground and in the airspace (Jacobs 2021a). Construction of aircraft parking aprons, fuel storage facilities, and aboveground facilities is typically prohibited within the airfield Clear Zone. The ends of the lateral clearance zone coincide with the runway ends, and the ground surface within this area must be clear of fixed or mobile objects, except permissible deviations such as NAVAIDS, arresting gear, and parallel taxiway shoulders (Jacobs 2021a).

The WIA runway (Runway 10/28) is south-southwest of B1502 (the existing airport/Base Ops Facility) with an east-west alignment, four ladder taxiways (Alpha, Bravo, Charlie, and Delta), and a parallel taxiway (Echo). There are two hot cargo pads (HCP). The airfield is equipped with lighting and air traffic control capabilities but does not operate under instrument rules (Jacobs 2021a). The 2021 Wake Atoll IDP (PRSC 2021a) characterizes the runway, taxiways, and aprons as being in good condition with minor deficiencies identified for repair; however, Taxiway Echo is within the rogue wave inundation zone making it susceptible to flooding and storm surges (PRSC 2021a).

Runway 10/28 is designated as Class B, which is intended for high-performance and large, heavy aircraft (DoD 2011), but there are non-standard design issues at Wake Island due to obstructions within the atoll's limited land conditions (Jacobs 2021a). These land constraints include inadequate spacing between the runway and parallel taxiway, HCPs that are too close to the runway, and roads and buildings within the lateral clearance zone. DoD airfield criteria typically prohibits construction of parallel taxiways, aircraft parking aprons, and similar non-runway pavements within the lateral clearance zone (Jacobs 2021a). Land restrictions around the airfield are major determinants in properly positioning the runway facilities to be compatible with existing or proposed infrastructure (Jacobs 2021a) and require permanent waivers when projects do not meet AICUZ standards (PRSC 2021a). PACAF is responsible for facilitating projects or installation needs identified in the IDP (PRSC 2021a), and land use constraints such as these must be considered when designing capital improvements.

None of the existing personnel support facilities (e.g., billeting, dining) are located near the runway, aprons, or other aircraft operations. These same type of support facilities are not in the vicinity of the MDA area, a personnel-restricted portion of the island which develops and tests technology to intercept ballistic missiles in all phases of flight.

3.2.2.2 Land Use

The islands comprising the atoll are approximately 1,747 acres separated into 65 habitat management units (HMUs) to assist with the management of vegetation and natural resources depending on their compatibility with installation development goals (USAF 2023d). The land is described as "wishbone" shaped with each arm approximately 4 miles in length. The combined area is roughly 9 miles long from tip to tip and 2 miles across at the widest point (USAF 2023d). The combined shoreline, including the lagoon, is almost 25 miles. The beaches range from 60 to 510 feet in width and consist of weathered coral cobble with limited sandy embankments. Most of the land has been heavily disturbed as a result of bombing and airstrikes during WWII, the development and destruction of WWII armament and defensive structures, or natural disasters and harsh climate conditions in the region. There are no undeveloped lands; there are vacant, cleared parcels and parcels with mixed vegetation marked by local and invasive species. Land use is divided into four activity areas (Table 1.1-1).

The following areas are located outside the ROI and are not included in this evaluation: the harbor/POL storage area at the western tip of the island, where the harbor is connected by a causeway to the bulk fuel storage area (PRSC 2021a); the MDA area where testing and training equipment and infrastructure are situated on the southeastern portion of the island; Wilkes Island, northwest of the atoll; and Peale

Island, west of Downtown, which is heavily overgrown and has no operational facilities (though it contains infrastructure of historical significance from early trans-Pacific travel and the WWII and Cold War eras).

Functional uses for each activity area evaluated for this assessment are identified in Table 3.2-2. Wake Island's remote location prevents any influence from outside regions and communities on land use planning, protections, and development.

Table 3.2-2 Wake Island Airfield Functional Area Features

AIRPORT AREA	INDUSTRIAL AREA	DOWNTOWN AREA
Runway	Fire and rescue	Medical clinic
Supporting taxiways	Aircraft fueling support facilities	DFAC
Lighting and NAVAIDS	Supply and warehouse buildings	Fire station
Tarmacs	Civil engineering building	Laundry facility and laundromat
Vacant areas between active and inactive facilities	Aviation and airfield maintenance shops	Gym, morale, welfare, and recreational facilities
Parking aprons	Water collection and distribution structures	Single-family housing
Electrical power generation		Billeting services

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USAF 2023d.

The Downtown area is approximately 61.73 acres within HMU 58 at the northwestern tip of Wake Island (USAF 2023d). Infrastructure on this land is described as inadequate due to age, exposure to salt air causing severe corrosion, and repeated storm damage.

B1104, the island's DFAC, was constructed in 1961 and there are no commercial dining facilities off the installation due to the island's remote location (PRSC 2020). The food preparation area is undersized, and inadequate HVAC systems lead to extreme temperatures, creating health hazards for kitchen staff. Other safety hazards are attributable to the fact that the DFAC does not have adequate freezer storage, requiring the use of freezers up to a mile away and making it difficult to maintain minimum food safety temperatures for transported items. The kitchen's foundation is also sinking.

B1116 was constructed in 1961 and contains a medical clinic and billeting office attached to a dormitory. The concrete is spalling, a new electrical system is necessary, and mold is present within the building. The medical clinic's ambulance has no garage, and the ambulance has corroded due to salty air exposure. The building is in a rogue wave inundation zone and has experienced repeat flood events (PACAF 2022).

The Base Living Quarters are a combination of dormitories, single houses, and duplexes totaling approximately 11,243 square meters (121,019 square feet; 2.78 acres) constructed between 1961 and 1970 (PACAF 2022). The fire protection systems do not meet current codes and the structure is in a state of continual deterioration from the atoll's harsh climate environment and repeated storm surges. Persistent mold in the mechanical systems and high humidity pose human health risks, in addition to falling ceilings and softened walls. There are no alternative living facilities due to the installation's remote location (PACAF 2022).

Under the Proposed Action, most Downtown facilities would be abandoned or removed and replaced with new Living Quarters and a CSF on lands within HMU 52. HMU 52 is approximately 45.33 acres (USAF 2023d) on the northern end of the island's eastern allotment. This area includes the former golf course bordered to the north and east by Wake Avenue, to the south by Heiwa Road, and on the west by HMU 58. The land's former use as a golf course provides open space consistent with the preferred facilities area identified in the Wake Island Master Plan (PACAF 2022). HMU 52's topography is disturbed, relatively flat (USAF 2023d), and an acceptable distance set back from the historical rogue wave and storm surge inundation zones. Concrete tee boxes and astroturf putting greens are intermittently placed throughout the former golf course in various states of disrepair. Some ground level structures, which may have also been tee boxes or former utilidors, are found throughout HMU 52. HMU 56 is 2.9 acres of disturbed, flat-lying property abutting HMU 52 where living quarters designated for detachment staff and distinguished visitors (DV) would be built. Concrete WWII structures covered by thick vegetation are within HMU 56 and accessible by walking from Wake Avenue.

Airport support facilities are also inadequate due to age, corrosion, and repeated storm damage. B1502 was built in 1962 and serves as the existing Base Ops Facility co-located with the airport terminal and air traffic control room. B1502 is eligible for the National Register of Historic Places (NRHP) for WIA's role in trans-Pacific air travel during the Cold War era (PRSC 2020). It also supported the transport of Vietnam War refugees during the 1960s and 1970s and some Strategic Defense Initiative missile testing at the end of the Cold War. B1502 is critical to WIA's mission but is failing due to corrosion, structural concrete spalling, and termite damage (PACAF 2022). It was damaged 5 years after construction by Typhoon Sarah and sustained further damage during 2006's Typhoon Ioke. The advanced state of failure requires upgrades to the electrical and HVAC systems as well as new windows and doors. The air traffic control room does not provide a 360-degree view of the airfield and is partially blocked by an adjacent building. The fire protection system does not meet current safety codes and the facilities overall do not meet USAF standards or Antiterrorism/Force Protection (AT/FP) standards and Architectural Barriers Act (ABA) criteria (PACAF 2022).

Facilities within HMU 30 include B1502, B106 (a defunct chapel), three American defensive features from WWII, and four memorials commemorating WWII battles and losses. The unit is approximately 16.82 acres east of the runway bordered to the north by North Pacific Avenue; to the south by the airfield, to the east by HMU 31; and to the west by Wake Avenue. This area is centrally located on flat terrain and contains the Marine Memorial, the Guam Memorial, the Morrison-Knudson Memorial, and the Japanese Memorial, all of which are NHL features. Three American defensive features described as WWII concrete bunkers or igloos directly south of the four memorials are also contributing elements to the NHL. B106 is a chapel positioned between Wake Avenue and the memorials. The chapel, constructed in 1967, has sustained heavy damage and is in a state of failure similar to infrastructure of its era on the island.

3.2.2.3 Noise

Land-based noise in the AICUZ is derived from aircraft traffic on the ground, vehicle traffic, generators, construction, and operations and maintenance in the nearby industrial area. Airspace noise is most commonly attributed to aircraft takeoffs and landings and infrequent missile launches on the southern end of the island. There are regularly scheduled passenger flights to/from the island and cargo deliveries each month and the MDA occasionally receives cargo deliveries for testing on the island (USAF 2023c). USAF cargo planes create the most noise at the airfield (PRSC 2022).

The highest periodic DNLs within the ROI are associated with the infrequent missile launches, with DNL exceeding 100 dBA for the occupied areas of the installation. However, because of their operational maneuvers, the period of the day in which they occur, and their single event sound level, the various aircraft utilizing WIA contribute the highest regular DNL surrounding the installation. The arrival and departure frequencies for these aircraft fluctuate based on a variety of conditions such as weather, DoD aircraft temporarily diverted to the island, refueling operations, and passenger flights for personnel shift rotations. Noise contours for aircraft operations have not been developed at the time of this analysis; however, previous EAs have assumed estimated daytime and evening baselines of 60-65 dBA and nighttime baselines of 45 dBA (USAF 2009, as cited in USDA 2021).

3.2.3 Environmental Consequences

3.2.3.1 Proposed Action

Significance indicators for AICUZ, land use, and noise have been defined by USAF as described in the following sections.

AICUZ

Potential significance indicators (in terms of AICUZ impacts) for land use near air installations include uses that:

- Concentrate people in a compact area
- Encroach vertically on airspace
- May draw birds/animals near airfields and create a strike hazard for aircraft
- May interfere with radio frequency
- Result in excessive lighting and impair pilot vision
- Result in smoke, dust, and steam and impair pilot vision

Because new facility construction under the Proposed Action would occur on available land and would not change existing airfield Accident Potential Zones, no significant impacts on AICUZ would occur. Construction would be guided by DoD Instruction (DoDI) 4165.57 and the IDP (PRSC 2021a).

The Proposed Action would have short-term, minor, direct adverse impacts on AICUZ during the demolition projects and peak construction. Following implementation of the Proposed Action, the impacts would be long-term, substantial, direct, and beneficial due to the improved safety of the new structures and the increased available parking space for aircraft transiting Wake Island. Facility locations would be outside of the airfield Clear Zone and the rogue wave inundation zone; the Base Ops Facility would be compliant with fire and DoD AT/FP requirements; and the control tower would have a 360-degree view of the airfield. Clear Zone land use restrictions would remain in effect to ensure compatibility with aircraft operations near all new facilities in the AICUZ area and to protect personnel.

Land Use

Significance is assigned to land use impacts from a Proposed Action based on land use sensitivity levels and their compatibility with the existing conditions of the area. Generally, significance indicators for land use impacts are whether the proposed land use is inconsistent or non-compliant with the existing plans or policies, affects the viability of existing land use, affects the area’s continued use or potential occupation, or affects the public health or safety of occupants of the adjacent land use.

Land use in three activity areas on the island would be impacted by the Proposed Action – the airport, the industrial area, and Downtown – as well as the area between Downtown and the industrial area. There would be no impacts on the harbor/POL storage area, the MDA area, or on either of the adjacent islands comprising the atoll. Land use changes proposed in the future and in the vicinity of these areas would be assessed in a separate NEPA analysis. No impacts on airspace would occur. Aviation operations would continue to follow established flight patterns.

The Proposed Action would expand the parking apron, improve the pavement to support existing standard operations, and develop parking space for additional aircraft (Jacobs 2021a). Construction-related impacts would be short-term, minor, direct, and adverse, followed by long-term, substantial, direct beneficial impacts attributable to safety enhancements and new infrastructure that are compatible with the mission's intent and development planning. Mitigation may be required if wetland disturbance is necessary to expand the apron or if construction disrupts scheduled take-offs and arrivals at the airport.

A total of 20 Downtown structures would be demolished as part of the Base Living Quarters project under the Proposed Action (PACAF 2022). Those facilities would be consolidated and rebuilt on the atoll's former golf course because the land is a reasonable distance from any airfield Clear Zone boundaries (Jacobs 2021a) and because it is located outside the rogue wave inundation zone with good access to utilities and roads (PACAF 2022).

Impacts on land use from construction and demolition would be short-term, moderate, direct, and adverse. Conditions would return to normal once these activities were completed. Following project implementation, the Proposed Action would result in long-term, substantial, direct beneficial impacts on land use compatibility by expanding expeditionary housing in accordance with the Area Development Plan (ADP) (Jacobs 2021a). Any land use compatibility issues encountered during future development projects would be evaluated under a separate NEPA analysis.

Noise

Impacts resulting from noise change may be considered significant if they violate any federal, state, or local noise ordinances. Substantially increasing areas of incompatible land use outside the WIA boundary would also be a significant indicator. Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels). The following general relationship exists between noise levels and human perception:

Table 3.2-3 Relationship Between Noise Levels and Human Perception

INCREASE IN dBA	PERCEPTION
1-2	Not perceptible to the average person
3	Barely perceptible to the human ear
5	Readily perceptible to the human ear
10	Perceived as a doubling of loudness to the average person
15	Perceived as more than a doubling of loudness to the average person

Notes:
Source: AASHTO 2023, FHWA 2011.

For purposes of this EA, an L_{max} value resulting in an increase in noise exposure of less than 5 dBA is considered negligible. An L_{max} resulting in an increase between 5 dBA and the U.S. Federal Highway Administration (FHWA) Road Construction Noise Model (RCNM) noise levels above would be considered a minor impact. Noise exposures above the RCNM noise levels would be considered a moderate impact, consistent with the definition of "substantial impact" in FHWA (2011) and American Association of Highway and Transportation Officials (AASHTO) (2023) guidelines.

Noise derived from the Proposed Action would include vehicle traffic, generators, construction, demolition, and miscellaneous operations and maintenance. This noise would add to baseline noise levels commonly attributed to aircraft take-offs, landings, and infrequent missile launches in the airspace. The Proposed Action would not alter airspace noise levels.

The Proposed Action would result in short-term, negligible, direct adverse impacts on the noise environment within the ROI. The RCNM was used to evaluate potential worst-case short-term noise impacts associated with the Proposed Action. The model was run for the closest project activity to sensitive noise receptors, specifically the demolition of B1128 (dormitory/physical fitness center) in proximity to B1181 (the existing chapel) and the closest residence in a contractor housing subdivision (B1011). No exceedances of RCNM noise levels would occur under the worst-case scenario. Noise from the demolition of B1128 would result in an L_{max} of 64.5 and 64.3 dBA at the exterior of B1118 and B1011, respectively. These values are below the assumed daytime baseline levels of 65 dBA and exceed assumed evening baseline noise levels by less than 5 dBA. Construction projects at WIA generally run 12-hour days (0700 – 1900 hours), therefore these exceedances would be expected to occur in the early evenings only.

The Proposed Action would result in long-term, negligible, direct adverse impacts on the noise environment within the ROI. The RCNM was run on two potential worst-case long-term noise exposure scenarios. The first scenario included the operation of delivery vehicles with backup alarms in conjunction with operation of the emergency generator at the CSF in proximity to the nearest new dormitory. The second scenario was the nighttime operation of the CSF emergency generator in proximity to the nearest new dormitory. No RCNM noise limit exceedances were identified for any of analyses performed on the identified worst-case scenarios. Exterior L_{max} noise exposures are not expected above the assumed daytime baseline of 65 dBA for the combined delivery and power generation scenario. While evening deliveries combined with emergency power generation could result in a 4.2 dBA increase above the assumed evening background of 60 dBA, this is less than the 5 dBA threshold and would be considered negligible.

For the nighttime emergency power generation scenario, exterior L_{max} noise exposures would exceed assumed nighttime baseline levels (45 dBA) by an estimated 16.2 dBA, however interior noise exposures are expected to remain unaffected. Because the majority of residents would be indoors between 2200 and 0700 and not exposed to exterior noise levels for an appreciable length of time, long-term noise impacts from nighttime emergency power generation are likewise considered to be negligible.

A copy of the report for the noise analysis is provided in Appendix E.

3.2.3.2 No Action Alternative

AICUZ

Under the No Action Alternative, AICUZ impacts would remain unchanged. The installation would not be able to meet USAF's strategic initiative to maximize long-term capabilities in a manner that best meets the ongoing mission needs and future development planning to "provide consistent air surveillance, airfield operations, and base operations support throughout Alaska, Hawai‘i, and Wake Island” (PRSC 2021a). Further strategic goals would go unmet, including those to revolutionize combat power and installation support for Airmen, Guardians, and their families by establishing strategic LOEs (AFIMSC 2023).

LUCs in the airfield Clear Zones would remain the same. The parking apron would not be expanded, and the air traffic control room would remain non-compliant with safety regulations because of its obstructed view of airfield facilities, including the runway. No existing buildings would be demolished, and no proposed structures would be built. Future projects would be evaluated against the current IDP to avoid incompatible land uses.

Land Use

Land use would remain unchanged under the No Action Alternative, resulting in long-term, minor, direct adverse impacts. Existing infrastructure would continue trending into disrepair, posing safety and health risks to military and civilian personnel using the buildings for daily operations, and existing facilities would be unable to accommodate a surge in aircraft on the island or provide additional space for aircraft parking, taxiing, and overall use of the tarmac. Installation land would not be used to its maximum potential efficiency. WIA’s IDP would guide current and future projects to ensure compatible, beneficial land use.

Until such time that installation operations change (e.g., new permanently assigned aircraft or flight patten changes, which would require modifications to airspace), no impacts on land use would be expected within WIA’s airspace and existing aircraft would continue using established flight patterns.

Noise

There would be no impact on noise under the No Action Alternative. Noise levels would remain unchanged. Operations would continue, but without the proposed new construction or infrastructure improvements. There would be no changes to airspace-generated noise. Future projects would be evaluated against the current AICUZ plan to avoid incompatible land uses.

3.2.4 Cumulative Impacts

3.2.4.1 AICUZ

The Proposed Action would result in long-term, substantial, cumulative beneficial impacts on AICUZ from the removal of ironwood trees surrounding the airfield as part of a separate planned invasive species removal project that was partially completed in FY2024, in addition to the parcels that would be cleared to accommodate airfield improvements under the Proposed Action. No changes to air traffic patterns, number of flights in WIA’s airspace, or additional aircraft permanently stationed at the airfield are anticipated. New facility construction would be guided by DoDI 4165.57 and the IDP to ensure compatible use on the installation and minimize potential impacts. The airfield improvements under the Proposed Action would allow WIA to support a potential surge in aircraft and offer increased safety and security measures during operations.

3.2.4.2 Land Use

Because there are no undisturbed lands on Wake Island, available land is limited; and development must be carried out in accordance with compatible use guidance and constraints. Therefore, long-term, moderate, cumulative beneficial impacts on land use would be expected from implementing the RFFAs in

Table 3.1-2. Land use constraints such as airfield Clear Zones, rogue wave inundation zones, and restricted areas (e.g., MDA) limit the amount of suitable land available for construction.

3.2.4.3 Noise

Noise levels would accumulate and may have compounding audio effects during overlapping construction or demolition projects, or if an aircraft surge occurs. This would result in short-term, minor to moderate, cumulative adverse impacts on the noise environment. These impacts would be resolved by ensuring proper noise protection, and minimization measures would be implemented to avoid human exposure to noise levels beyond 65 dBA for long durations. This could be achieved using various sound damping systems, scheduling and/or administrative controls, and proper noise modeling. With these steps implemented, substantial cumulative impacts on noise on-base would not be anticipated.

3.3 Air Quality

3.3.1 Definition of Resource

3.3.1.1 Air Quality

Air quality (AQ) is defined by ambient air concentrations of specific pollutants determined by the U.S. Environmental Protection Agency (EPA) to be of concern with respect to the health and welfare of the public. Six major pollutants of concern, called “criteria pollutants,” are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), total suspended particulate matter less than or equal to (≤) 2.5 ($PM_{2.5}$) and 10 (PM_{10}) micrometers in aerodynamic diameter, and lead. Air pollution is the presence of these criteria pollutants in excess of EPA standards. If AQ in a geographic area meets or is cleaner than the national standard, it is called an attainment area. Areas that do not meet the national standard are called nonattainment areas (EPA 2022). If an area was previously in nonattainment but now meets the standard, it is called a maintenance area. Maintenance areas must have an approved maintenance plan to meet and maintain AQ standards.

3.3.1.2 Greenhouse Gas Emissions and Climate Change

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. GHG emissions are generated by both natural processes and human activities. Recent scientific evidence indicates a correlation between increasing global temperatures over the past century and the worldwide proliferation of GHG emissions by humankind. Climate change associated with global warming is predicted to produce negative environmental, economic, and social consequences across the globe (U.S. Global Change Research Program [USGCRP] 2018).

GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential (GWP), which is a function of its lifetime and ability to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of 1. To simplify GHG analyses, total GHG emissions from a source are often expressed as a carbon dioxide equivalent (CO_2e). CO_2e is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such greater quantities that it is the overwhelming contributor to global CO_2e emissions from both natural processes and human activities.

Climate change presents a global problem caused by increasing global atmospheric concentrations of GHG emissions, and the current state of the science surrounding it does not support determining the global significance of local or regional emissions of GHGs from a particular action. Therefore, the quantitative analysis of CO_2e emissions in this EA is for disclosing the local net effects of the project alternatives and for its potential usefulness in making reasoned choices among alternatives.

3.3.2 Affected Environment

3.3.2.1 Air Quality

Wake atoll falls under the jurisdiction of EPA Region 9 for AQ regulation purposes; however, EPA Region 9 has determined that the Clean Air Act (CAA) does not apply to Wake Island (Chugach Support Services, Inc. [Chugach] 2004). The emissions inventory at the atoll consists of stationary and transient aircraft, vehicles used by personnel stationed on the island, four Cummins diesel prime power generators, and approximately 10 diesel emergency backup power generators (USAF 2023a). Ambient AQ is not monitored at the atoll and no evident AQ concerns currently exist, as any emissions that are released are quickly dispersed by the strong trade winds. The atoll does not meet the CAA threshold requiring a Title V Operating Permit, and no ambient AQ standards have been exceeded in the region. There are no islands within several hundred miles of the atoll to or from which air pollutants could travel, and there are no nearby communities that could be affected by the emissions generated at the atoll (MDA 2007).

3.3.2.2 Greenhouse Gas Emissions and Climate Change

The climate at the atoll is maritime and chiefly controlled by the easterly trade winds, which dominate the island throughout the year. The temperatures range from 72 to 89 degrees Fahrenheit with relative humidity between 71% and 78%. Due to the presence of minimal vegetation and the absence of topographic or standoff barriers, the atoll is subject to consistent exposure to the wave action of the Pacific Ocean. Prevailing winds originate in the north-northeast with some minor seasonal variation. Wind speed varies between 5 to 23 miles per hour, with average speeds of 12 to 16 miles per hour (PRSC 2021a).

No ambient AQ monitoring data is available for Wake Island (USAF 2023a); however, air pollution levels on Wake Atoll are estimated to be low due to the atoll’s small size, isolated location, and meteorological conditions. Although air pollutants associated with air traffic and daily operations are released on Wake Atoll, the releases are negligible in relation to the atoll’s location in the Pacific Ocean.

3.3.3 Environmental Consequences

USAF has defined significance indicators for AQ impacts as whether an action would interfere with the state’s ability to maintain the National Ambient Air Quality Standards (NAAQS) or result in a violation of any federal, state, or local air regulation.

3.3.3.1 Proposed Action

Short-term, moderate, direct adverse impacts on AQ and long-term, negligible, direct adverse impacts on climate would occur as a result of the Proposed Action. Airborne dust and other pollutants generated during construction, demolition, and renovation projects, as well as smoke from the burning of felled ironwoods, would cause short-term emissions increases. Best management practices (BMPs) would be implemented to minimize dust generation, and may include air monitoring, watering in areas where dust is considered an issue, and running equipment only when it is needed. Air monitoring would be conducted to monitor dust and smoke levels and other potential AQ impacts. Following project completion, AQ would return to ambient levels.

Under EPA's General Conformity rule, those responsible for a federally funded project must work with the state agency responsible for a nonattainment or maintenance area to ensure that federal actions conform to the AQ plans established in the applicable state implementation plan. *De minimis*, in reference to emissions levels, is the minimum threshold for which a conformity determination must be performed for various criteria pollutants in various areas. USAF has developed an automated screening tool known as the Air Conformity Applicability Model (ACAM) to perform a simplified General Conformity Rule Applicability Analysis for non-transportation proposed actions and projects. Air assessments were conducted using a net change analysis with ACAM based on the best information available regarding concurrent actions and project phasing. Net annual emission increases from the Proposed Action are presented in the table below:

Table 3.3-1 Air Conformity Applicability Model Analysis Summary

POLLUTANT	ACTION EMISSIONS (TON/YR)	INSIGNIFICANCE INDICATOR	
		INDICATOR (ton/yr)	EXCEEDANCE (YES or NO)
2029			
VOC	1.097	250	No
NO_x	3.883	250	No
CO	7.535	250	No
SO_x	0.002	250	No
PM_{10}	2.194	250	No
$PM_{2.5}$	0.129	250	No
Pb	0.000	25	No
NH_3	0.021	250	No
CO_2e	1239.6		
2030			
VOC	8.489	250	No
NO_x	10.021	250	No
CO	19.282	250	No
SOx	0.031	250	No
PM_{10}	45.094	250	No
$PM_{2.5}$	0.364	250	No
Pb	0.000	25	No
NH_3	0.057	250	No
CO_2e	3501.1		
2031 (STEADY STATE)			
POLLUTANT	**ACTION EMISSIONS (TON/YR)**	**INSIGNIFICANCE INDICATOR**	
		INDICATOR (ton/yr)	**EXCEEDANCE (YES or NO)**
VOC	0.000	250	No
NO_x	0.000	250	No
CO	0.000	250	No
SOx	0.000	250	No
PM_{10}	0.000	250	No
$PM_{2.5}$	0.000	250	No

Table 3.3-1 Air Conformity Applicability Model Analysis Summary

POLLUTANT	ACTION EMISSIONS (TON/YR)	INSIGNIFICANCE INDICATOR	
		INDICATOR (ton/yr)	EXCEEDANCE (YES or NO)
Pb	0.000	25	No
NH_3	0.000	250	No
CO_2e	0.0		

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: ACAM Report (Appendix B).

None of the estimated annual net emissions associated with this action are above the USAF insignificance indicators, indicating no significant impact on AQ. Therefore, the Proposed Action would not cause or contribute to an exceedance of one or more NAAQSs. As the emergency generators being removed under the Proposed Action would be replaced with new, similar sized units, no long-term (steady state) increase in emissions is anticipated as a result of the Proposed Action.

Appendix B presents the summary and detail reports for the ACAM Analysis conducted for the Proposed Action, which concludes that increases in emissions would be less than the General Conformity rule *de minimis* thresholds and would occur in an area that is within attainment for all criteria pollutants.

3.3.3.2 No Action Alternative

The No Action Alternative would not change baseline emissions and consequently would have no impact on AQ. New development at the atoll would continue regardless of the No Action Alternative. Construction of additional facilities and population surges would increase the demand for power and heat, resulting in increased emissions. Vehicles and equipment used for new development projects would also increase emissions. The atoll would continue to ensure compliance with federal AQ laws and would consult with EPA to employ any required mitigation measures.

3.3.4 Cumulative Impacts

Short- and long-term, minor to moderate, cumulative adverse impacts could occur as a result of the Proposed Action and other RFFAs. New development at WIA would continue regardless of the No Action Alternative. Construction of additional facilities would increase power and heat demand, resulting in increased power plant emissions. Vehicles and equipment used for new development projects would increase emissions above baseline. WIA would continue to ensure compliance with state and federal AQ laws and would consult with EPA to deploy mitigation measures if necessary.

3.4 Water Resources

3.4.1 Definition of Resource

Water resources are surface waters and groundwater that provide drinking water and support recreation, transportation, commerce, industry, agriculture, and aquatic ecosystems (EPA 2023a). Disruption of any one component of the watershed can affect the entire system. EPA's regulatory definition of the term WOTUS is listed in 40 CFR 120.2. USACE's WOTUS definition is listed in 33 CFR 328.3. This resource is defined by the Clean Water Act (CWA), as amended, and jurisdiction is addressed by the two agencies to include navigable waters, tributaries of such waters, non-navigable interstate waters and their tributaries, non-navigable intrastate waters whose use or misuse could affect interstate commerce, and freshwater wetlands "adjacent" to other jurisdictional waters. The excavation, deposition, or construction in or over any navigable water of the U.S. is further subject to USACE authorization under Section 10 of the Rivers and Harbors Act (33 USC 403). Section 401 of the CWA requires water quality certification (usually issued at the state level) for any activity that may result in any discharge into WOTUS.

The Fish and Wildlife Coordination Act (FWCA) (16 USC 661-667e) was enacted on 10 March 1934 to protect fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. The FWCA provides the basic authority for USFWS to evaluate impacts on fish and wildlife from proposed water resource development projects. Water resources relevant to WIA include wetlands, floodplains, surface waters, and groundwater.

3.4.1.1 Wetlands

USACE and EPA define jurisdictional wetlands as those meeting the three criteria defined in the USACE Wetlands Delineation Manual (USACE 1987) and falling under USACE jurisdiction. These criteria are vegetation, soil, and hydrology. Unless an area has been altered or is a rare natural situation, wetland indicators of all three characteristics must be present during some portion of the growing season for an area to be defined as a wetland. Wetlands are an important natural system and habitat because of their diverse biologic and hydrologic functions, including water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection.

Wetlands are a special category of WOTUS subject to regulatory authority under Section 404 of the CWA and EO 11990. Under the CWA, wetlands are defined as "those areas that are inundated or saturated by surface or groundwater 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" (33 CFR 328.3).

AFMAN 32-7003, *Environmental Conservation*, paragraphs 3.20, "The EIAP for Actions that May Affect Waters of the United States," and 3.60, "Clean Water Act Compliance," provide additional guidance on protection of wetlands to preserve and enhance their natural and beneficial values while carrying out the USAF mission.

3.4.1.2 Floodplains

EO 11988 defines floodplains as "lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, including at a minimum, that area subject to a 1% chance of flooding in any given year." Areas subject to a 1% chance of annual flooding are called 100-year floodplains, and areas subject to a 0.2% chance of annual flooding are called 500-year floodplains. EO 11988 directs federal agencies to avoid actions in floodplains unless the agency determines no practicable alternative exists. Where the only practicable alternative is to site in a floodplain, the agency should develop measures to reduce impacts and mitigate unavoidable impacts.

Additionally, EO 11988 directs federal agencies to comply with the National Flood Insurance Program. In accordance with AFMAN 32-7003, paragraph 3.23, USAF will make informed decisions concerning the environmental impacts of infrastructure projects and ensure that development occurs in an environmentally sensitive manner. USAF follows the Federal Building Codes requirements within 41 CFR 102-76.10(c), which state that "Federal agencies, upon approval from the General Services Administration… follow nationally recognized model building codes and other applicable nationally recognized codes that govern federal construction to the maximum extent feasible and consider local code requirements (see 40 USC 3310 and 3312).” As such, federal projects follow local construction codes to the maximum extent practicable.

3.4.1.3 Surface Waters

Surface waters include natural, modified, and constructed water confinement and conveyance features above groundwater that may or may not have a defined channel and discernable water flows. Stormwater is surface water generated by precipitation events that may percolate into permeable surficial sediments or flow across the top of impermeable or saturated surficial areas, a condition known as runoff. Stormwater is a key component of surface water systems because of its potential to introduce sediments and other contaminants. Stormwater flows, which can be exacerbated by high proportions of impermeable surfaces, are important to surface water management.

National Pollutant Discharge Elimination System

Section 402 of the CWA establishes federal limits on the discharge of specific pollutants to surface waters through the National Pollutant Discharge Elimination System (NPDES). Section 401 of the CWA requires state certification for NPDES permits. The NPDES stormwater program requires facility operators and owners with stormwater discharges to obtain a Multi-Sector General Permit (MSGP). In addition, construction site operators disturbing 1 acre or more are required to obtain a Construction General Permit (CGP) for stormwater discharges. The permit mandates use of BMPs to ensure that the facility’s operations and soil disturbed during construction do not pollute nearby water bodies. Operators must prepare a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan (SWPPP) that is implemented during construction and facility operations.

Unified Facilities Criteria 3-210-10, *Low Impact Development*

The Unified Facilities Criteria (UFC) system provides planning, design, construction, sustainment, restoration, and modernization criteria to the Military Departments, the Defense Agencies, and DoD Field Activities in accordance with the Under Secretary of Defense Acquisition, Technology and Logistics Memorandum DoD UFC, dated 29 May 2002.

Section 438 of the Energy Independence and Security Act (EISA) and the Deputy Under Secretary of Defense DoD policy on implementation of stormwater requirements under EISA Section 438 apply to federal projects with a footprint greater than 5,000 square feet. UFC 3-210-10 provides technical criteria, technical requirements, and references for the planning and design of applicable DoD projects to comply with EISA Section 438 stormwater requirements. Low impact development (LID) is a stormwater management strategy designed to maintain site hydrology and mitigate adverse impacts of stormwater runoff and non-point source pollution. LID seeks to restore pre-development surface water infiltration rates at project sites through one or more LID Integrated Management Practices and design techniques that, to the maximum extent feasible, infiltrate, store, and evaporate runoff close to its source of origin. Examples of LID-compliant design techniques are bio-retention areas and permeable pavements.

3.4.1.4 Groundwater

Groundwater is subsurface water that occupies the space between and within sand, clay, and rock formations. The Safe Drinking Water Act (40 CFR 141) prohibits federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area. Groundwater can typically be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

3.4.1.5 Wild and Scenic Rivers

In 1968, the Wild and Scenic Rivers Act (WSA; Public Law 90-542; 16 USC 1271 *et seq.*) established the National Wild and Scenic Rivers System (National System) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The WSA is notable for safeguarding the special character of Wild and Scenic Rivers, while recognizing the potential for their appropriate use and development (National System 2023). The four federal agencies charged with safeguarding the National System (the "river-administering agencies") are the Bureau of Land Management, National Park Service (NPS), USFWS, and the U.S. Forest Service (USFS).

Section 7(a) of the WSA prohibits federal agencies from assisting in the construction of any "water resources project" that would have a "direct and adverse effect" on a designated river or congressionally authorized study river (USFS 2004). Project proponents are required under WSA Section 7 to consult with the applicable river-administering agency to evaluate the potential effects of a proposed water resources project on free flow, water quality, and outstandingly remarkable values. Although the WSA does not define "water resources project," river-administering agencies have generally interpreted the term to refer to any construction or development that could affect a river's free flow. The U.S. Department of Agriculture (USDA) defines the term in regulation as any "construction of developments which could affect the free-flowing characteristics of a wild and scenic river or study river," such as dams, reservoirs, levee constructions, bank stabilization, channelization, or bridges (USFS 2004; Congressional Research Service [CRS] 2020).

3.4.2 Affected Environment

3.4.2.1 Wetlands

A wetland delineation was conducted in March 2023 to determine the presence or absence of wetlands in a 1,190.1-acre study area that encompasses the eastern side of Wake Island from Peacock Point to Downtown (Figure 3.4-1; Stantec 2023). The footprint of each project associated with the Proposed Action was contained within the wetland study area. Wetlands make up 1.4% (16.8 acres) of the study area and are found on small islands; lining various inlets within the lagoon; and between two marine-influenced depressional ponds. No wetlands identified in the study area geographically overlap the footprints of projects associated with the Proposed Action. Waters make up 25.2% (299.6 acres) of the study area and are predominantly marine. Seven ponds make up 0.6% (7.6 acres) of the study area, including the 0.11-acre Pond 5, which is within the footprint of the proposed parking apron. The full preliminary jurisdictional determination (PJD) report is provided in Appendix C and is incorporated by reference. Table 3.4-1 presents a summary of the findings of the 2023 delineation.

Table 3.4-1 Wetlands and Waters within the Study Area

STATUS	ACRES	PERCENT OF STUDY AREA
Palustrine Wetlands	16.8	1.4
TOTAL WETLANDS	**16.8**	**1.4**
Palustrine Waters (Ponds)	7.6	0.6
Marine Waters	292	24.5
TOTAL WATERS	**299.6**	**25.2**
TOTAL WETLANDS AND WATERS	**316.4**	**26.6**

Table 3.4-1 Wetlands and Waters within the Study Area

STATUS	ACRES	PERCENT OF STUDY AREA
Uplands	873.7	73.4
TOTAL STUDY AREA	**1,190.1**	**100.0**

Notes:
Apparent inconsistencies in sums are the result of rounding. **Bold text** is used for subtotals.
Source: Stantec 2023.

3.4.2.2 Floodplains

Floodplains have not been mapped or identified on Wake Island. The island is subject to rogue wave inundation. The primary inundation zone areas on the island are the northern section of Downtown, the lagoon (west) side of the industrial area, the north part of the runway (encompassing the parallel Taxiway Echo), and the road at the harbor (PRSC 2021a).These areas may become submerged, causing significant damage to structures on the island. The taxiways and areas around the HCPs have been buried in sand and sediment during rogue wave events (Jacobs 2021a). Rogue waves are discussed further in Section 3.9.

3.4.2.3 Surface Waters

Deep water surrounds the atoll, but the lagoon is shallow, ranging from 1 to 15 feet deep with an average of 10 feet deep, and covers approximately 1.5 square miles (USAF 2023d). Surface water drains well due to the porous ground surface, but this same permeable barrier prevents freshwater from accumulating in any aquifers or natural water supplies pooling on the surface (PRSC 2021a). The intertidal zone is often turbid due to ocean and tidal currents mixing sediments and consists of reefs with rocky or coral substrate and portions of sandy bottoms. Historical activities, such as the Wilkes Island causeway, have recontoured the shoreline and disrupted how the ocean current flows through the lagoon. There are no surface water impoundments (USAF 2021), and freshwater runoff is collected and conveyed in localized areas (PRSC 2022). As of 2023, no bathymetric survey data had been collected (USAF 2023d).

There are several stormwater drains Downtown in the vicinity of the DFAC and housing, and approximately three others scattered across other parts of the island. Stormwater collected in these drains flows through pipes to the atoll’s lagoon. There are no active or seasonal streams, and stormwater runoff from roads and other developed areas is prevented from flowing into the ocean by a vegetative belt around the perimeter of the island. Stormwater from these areas seeps into the porous sandy ground. Stormwater pollution prevention is managed by the WIA SWPPP (Arctic Slope Regional Corporation [ASRC] Federal Communications 2021), and the installation is authorized under a 2021 MSGP MWR053000 for industrial stormwater discharge.

1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

WETLANDS AND WATERS SURVEYED AT WAKE ISLAND

Legend

- ROI
- Wetlands Delineation Study Area
- Wetland
- Pond 1
- Pond 2
- Pond 3
- Pond 4
- Pond 5
- Pond 6
- Pond 7 (Non-jurisdictional)

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Main map satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Location map Imagery source: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors.
3. Wetlands delineation features source: Stantec. 2023. Final Preliminary Jurisdictional Determination Report, Figure 2. Wake Island Airfield, Wake Atoll. 9 August 2023.

WGS 1984 UTM ZONE 4 N, METERS
HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

1,750 875 0 1,750 3,500
Feet

PROJECT No.: 321804	DATE: 7/22/2024	FIGURE:
P.M.: S.B.	DRAWN: T.A.	3.4-1

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3.4.2.4 Groundwater

Groundwater on the atoll is limited, brackish, and non-potable as a result of the small area, flat topography, and substrate (USAF 2023d). Shallow, brackish groundwater lenses occur in the highly permeable sands. Any freshwater that infiltrates into the permeable substrate is less dense than the underlying brackish groundwater and remains segregated on top of the brackish water. Freshwater runoff from rooftops and roadways tends to drain rapidly into the lagoon or the Pacific Ocean (USAF 2023d). Drinking water is provided by two Reverse Osmosis Water Purification Units (ROWPUs) at the desalinization plant (B1303; EPA 2021).

3.4.2.5 Wild and Scenic Rivers

There are no Wild and Scenic Rivers on Wake Island; therefore, they are not included in this assessment.

3.4.3 Environmental Consequences

3.4.3.1 Proposed Action

Wetlands

The Proposed Action would have long-term, negligible, direct adverse impacts on wetlands. Of the 16.8 acres of wetlands identified in the ROI (Stantec 2023), none overlap geographically with the Proposed Action's project footprints. To mitigate potential impacts from construction site stormwater runoff into nearby wetlands, USAF would apply for coverage under an EPA CGP, and activities would be conducted in accordance with the permit and the installation SWPPP. Soil erosion, sediment controls, and construction site waste controls that would be employed to minimize impacts on wetlands in the ROI are further discussed in this section under Surface Waters. BMPs that would be employed to minimize impacts on wetlands and other WOTUS include prohibiting tracked or wheeled equipment in wetlands and accessing project sites via established roads outside of wetland areas.

The PJD determined that one of the seven ponds identified in the ROI, Pond 5, is entirely within the proposed parking apron footprint. Pond 5 is connected via culverts to the atoll's lagoon, a traditional navigable water under the CWA definition of WOTUS subject to USACE jurisdiction. Therefore, the Proposed Action would have long-term, direct adverse impacts on WOTUS in the ROI. Because Pond 5 comprises only about 1.5% of the seven ponds in the study area, the impacts would be minor. Prior to project implementation, USAF would obtain a USACE general permit in accordance with Section 404 of the CWA and Section 10 of the Rivers and Harbors Act and a water quality certification from the State of Hawaiʻi Department of Health in accordance with Section 401 of the CWA.

Floodplains

The Proposed Action would have short-term, direct adverse impacts on the base flood elevation on Wake Island. However, during rogue wave events, any net increase in base flood elevation resulting from the Proposed Action would be temporary and localized, because the floodwater would soon drain back into the ocean; therefore, the overall impact would be negligible. Portions of the airfield most vulnerable to rogue waves and storm surges were avoided when siting locations for the aircraft parking areas, fuel storage facilities, and supporting infrastructure (Jacobs 2021a). The Base Ops Facility, CSF, and Base Living Quarters locations were also chosen due to their positioning outside of the rogue wave and storm surge inundation zones (PACAF 2022).

Surface Waters

The Proposed Action could have short-term, minor, direct adverse impacts on surface waters resulting from ground-disturbing construction activities such as clearing, grading, trenching, and excavating, which could displace soil and sediment into nearby waterbodies. However, construction would be conducted in accordance with the EPA-issued CGP for stormwater discharges. Surface water flows and impoundments impacted by the Proposed Action would be minimized by following BMPs outlined in the CGP and guidance established in the project SWPPP (ASRC Federal Communications 2021):

- Grade and create berms and/or curbs to prevent runoff and divert run-on.
- Locate materials, equipment, and maintenance indoors or where any leaks would be contained.
- Promptly clean up spills and leaks using dry methods (e.g., sorbents).
- Place drip pans and sorbents under leaking vehicles and equipment, once identified, until repairs can be completed.
- Use spill/overflow protection equipment for aircraft fueling, as prescribed in the appropriate AFI.
- Drain fluids from equipment and vehicles prior to onsite storage or disposal.
- Perform cleaning operations indoors, under cover, or in areas that prevent runoff and run-on and that capture any overspray.
- Routinely inspect for leaks or conditions that could lead to discharges of chemicals to stormwater.
- Properly store hazardous and non-hazardous materials (i.e., store materials in appropriate containers and properly segregated; ensure containers are closed and oily rags, etc., are not left out when no longer in immediate use).
- Perform routine inspections for leaks and conditions of drums, tanks, and containers.
- Maintain well-organized work areas, minimizing tripping and spill hazards.
- Routinely pick up and dispose of garbage and waste materials and maintain regular cleanup schedules.
- Use absorbent materials and spot clean for small spills, then properly dispose of used/ contaminated materials.
- Conduct training programs for employees about these practices.

The Proposed Action would result in long-term, minor, direct adverse impacts on surface water from the addition of impermeable surfaces leading to increased runoff. These impacts would be minimized by following established BMPs for ground disturbance and surface water management and designing projects to comply with EISA Section 438 and UFC 3-210-10. Project design for impermeable developments would include LID-compliant techniques such as bio-retention and permeable pavements, as well as stormwater conveyance features, as needed, to incorporate new sources of runoff into the installation's stormwater system and to maintain or restore pre-development site hydrology to the maximum extent practicable. Where stormwater system components are installed, the installation's NPDES permit and SWPPP would be updated to reflect the additions.

Groundwater

The Proposed Action would have long-term, negligible, indirect beneficial impacts on groundwater by removing ironwood trees to improve airfield safety and clear parcels of land identified for new facility construction, reducing groundwater uptake by these trees (PRSC 2022). The groundwater saved would become available to native flora and have no other impact on the atoll's limited drinking water sources. There are no EPA-designated sole source aquifers on Wake Atoll; therefore, there would be no impact on this resource.

Wild and Scenic Rivers

The Proposed Action would have no impact on Wild and Scenic Rivers because none are on the island.

3.4.3.2 No Action Alternative

Under the No Action Alternative, it is presumed that on-base improvements would continue regardless of whether the Proposed Action were implemented. If wetlands could be adversely impacted, USAF would follow applicable regulations under the CWA and consult with USACE to determine the intensity and duration of such impacts and define mitigation measures. Rogue waves would continue to flood portions of the island and degrade infrastructure, resulting in short- and long-term, minor to substantial, direct adverse impacts on the floodplain. Any new construction would result in increased impermeable surfaces over time, as well as increased stormwater and wastewater discharges. This would result in long-term, negligible, direct adverse impacts on surface waters (sheet flows). There would be no impact on groundwater, because groundwater consumption would remain the same for local vegetation and would not affect the quality or availability of drinking or potable water used by personnel stationed on the island; and no impact on Wild and Scenic Rivers, because none are present.

3.4.4 Cumulative Impacts

3.4.4.1 Wetlands

At this time, no other projects have been identified that, in conjunction with the Proposed Action, would cause significant cumulative adverse impacts on wetlands. Because the Proposed Action would not contribute to the fill of wetlands requiring a Section 404 permit, there would be no cumulative impacts regarding loss of total wetlands. Construction projects occurring concurrently with the Proposed Action may result in short-term, minor, cumulative adverse impacts on wetlands from construction site stormwater runoff. A NPDES CGP and adherence to sediment erosion and stormwater pollution controls for applicable projects would mitigate these impacts. Potential long-term, minor to moderate, cumulative adverse impacts on wetlands could result from increased sheet flows caused by the addition of impermeable surfaces (pavement, buildings); however, permanent stormwater controls would be incorporated into project designs to reduce pollutants in stormwater and minimize impacts.

3.4.4.2 Floodplains

The addition of impermeable surfaces under the Proposed Action and RFFAs would increase the base flood elevation on the island during rogue wave events. Cumulative adverse impacts on the floodplain would be minor, temporary, and localized, because the floodwater would recede into the surrounding waters post-inundation. Construction would follow EO 11988 and *Memorandum for Floodplain Management on DoD Installations* (DoD 2014) to minimize floodplain impacts attributable to the Proposed Action and other RFFAs. These minimization measures would not change the frequency or intensity of flooding or affect the island's ability to moderate rogue waves; however, adherence to these regulations would reduce the effects of inundation in the ROI.

3.4.4.3 Surface Waters

The Proposed Action, in conjunction with RFFAs, could result in short- and long-term, moderate, cumulative adverse impacts on surface waters from ground disturbance and increased impermeable surfaces. Soil disturbance could result in erosion, sedimentation into local surface water conveyances, and water quality degradation. However, these impacts would be minimized by following established BMPs for ground disturbance and surface water management. Project design for new impermeable developments would include stormwater conveyance features, as needed, to incorporate new sources of runoff into the installation's stormwater system and to maintain or restore pre-development site hydrology to the maximum extent practicable.

3.4.4.4 Groundwater

The Proposed Action, in conjunction with RFFAs, could result in long-term, minor, cumulative adverse impacts on groundwater from spills or leaks of fuels, oils, and other contaminants leaching to the groundwater, as almost all RFFAs require fuels and other potentially hazardous materials for construction and facility improvements. Equipment maintenance standards, secondary containment for temporary hazardous materials storage, project-specific BMPs, and adherence to the WIA Spill Prevention, Control, and Countermeasures (SPCC) Plan would minimize the potential for contaminating groundwater and the island's coral aquifer. The Proposed Action and RFFAs would increase the total area of impermeable surfaces on the island. Runoff from these surfaces would infiltrate the permeable substrate or flow to discharge points within the installation boundary, but reduction in groundwater recharge would not be anticipated.

3.4.4.5 Wild and Scenic Rivers

There would be no cumulative impacts on Wild and Scenic Rivers, because none are on the island.

3.5 Safety and Occupational Health

3.5.1 Definition of Resource

A safe environment is one in which no potential for death, serious bodily injury or illness, or property damage exists, or where that potential has been optimally reduced. Safety and occupational health address the well-being, safety, and health of members of the public, contractors, and USAF personnel during the various aspects of the Proposed Action and the No Action Alternative.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. The proper operation, maintenance, fueling, and repair of aircraft and equipment also carry important safety implications. Activities that can be hazardous include transportation, maintenance and repair, construction, and activities that occur in extremely noisy environments. This EA addresses the safety implications from construction, general operations and maintenance, and flight operations associated with the Proposed Action and No Action Alternative.

3.5.1.1 Construction Safety

Contractors performing construction are responsible for following federal Occupational Safety and Health Administration (OSHA) regulations and are required to conduct construction in a manner that does not increase risk to workers or the public. OSHA regulations set and enforce protective workplace safety and health standards. The regulations are designed to control these hazards by eliminating exposure to the hazards via administrative or engineering controls, substitution, use of personal protective equipment (PPE), and availability of safety data sheets. Contractors performing construction on USAF installations are also responsible for following Air Force Occupational Safety, Fire, and Health (AFOSH) standards identified within AFI 91-202, *The U.S. Air Force Mishap Prevention Program* (USAF 2022b) and AFMAN 91-203, *Air Force Occupational Safety, Fire, and Health Standards* (USAF 2022c). The purpose of these standards is to minimize the loss of USAF resources and protect personnel from occupational deaths, injuries, or illnesses by managing risks. Together, these standards aim to ensure USAF workplaces meet federal safety and health requirements.

Employers are responsible for providing a safe workplace under OSHA. Employers must follow relevant OSHA safety and health standards, including: review potentially hazardous workplace conditions; monitor exposure to workplace chemicals (e.g., asbestos, lead, other hazardous substances, contaminated soil), physical hazards (e.g., noise, falls), biological agents (e.g., infectious waste, wildlife, plants), and ergonomic stressors; recommend and evaluate controls (prevention, administrative, engineering, PPE) to ensure personnel exposure is eliminated or adequately controlled; and ensure a medical surveillance program is in place to perform occupational health physicals for workers subject to the use of respiratory protection or engaged in hazardous waste, asbestos, lead, or other work requiring medical monitoring.

AFMAN 32-3001 establishes the USAF Explosive Ordnance Disposal (EOD) Program. The purpose of this program is to mitigate hazards to personnel and property posed by weapons and explosive materials in all physical domains. USAF EOD members provide an emergency response capability to detect, locate, access, diagnose, render safe, recover, and dispose of explosive ordnance. The program includes requirements for EOD-related activities such as training, emergency response, strategic planning, transportation of explosive hazards, and installation and mission support (USAF 2022d).

3.5.1.2 Mission Safety

Risk management guidance documents minimize loss of USAF resources and protect personnel from occupational deaths, injuries, or illnesses. Adherence to industrial-type safety procedures and directives ensures safe working conditions for DoD aircraft operations and maintenance. DoD Directive 4715.1E, *Environment, Safety, and Occupational Health*, and AFI 91-203 provide industrial and occupational safety guidance for implementation of the OSHA standards in 29 CFR. AFI 91-202 guides the Mishap Prevention Program requirements, assigns program responsibilities, and contains program management information. These instructions apply to all USAF activities.

AT/FP and ABA criteria are established within UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings for the protection of USAF personnel and property. This UFC applies to all DoD components and all DoD-inhabited buildings (DoD 2022). Engineering of buildings at USAF installations is also governed by various International Building Codes, International Fire Codes, and National Fire Protection Association Codes for safety of building occupants.

3.5.1.3 Flight Operations

The primary safety concern for military flights is the potential for aircraft mishaps (i.e., crashes or crash landings). Bird and wildlife strikes are also a flight safety concern due to the potential aircraft damage or injury to aircrews. AFI 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program*, provides guidance on establishing a BASH Program, which can significantly reduce strike hazards by properly managing habitat on and surrounding military airfields.

In accordance with DoDI 4165.57, *Air Installations Compatible Use Zones* (DoD 2011), Accident Potential Zones are established at military airfields to delineate recommended compatible land uses for the protection of people and property. AICUZ for WIA, including the Clear Zone, is described in Section 3.2.

3.5.2 Affected Environment

The generally affected environments for safety and occupational health analyses are areas where existing buildings would be demolished and the new Base Ops Facility, CSF, and Base Living Quarters would be constructed.

3.5.2.1 Construction Safety

Contractors performing construction at WIA are required to conduct activities in accordance with OSHA and USAF requirements concerning safety in the workplace.

Combat-related munitions and explosives of concern (MEC) were used at WIA to support Pacific military operations during WWII. The atoll was a combat zone, and MEC have been found at Peale, Wilkes, and Wake Island since that time (USACE 2013); unexploded ordnance (UXO) have been encountered in many places at WIA such as the golf course and near B1601 (old Air Traffic Control Tower). In the years following WWII, all known combat-related munitions were detonated in place or disposed of at the EOD range at Toki Point on Peale Island or Peacock Point at the southern tip of Wake Island. Peacock Point is used periodically for MEC disposal if the items are deemed safe to move (USACE 2013). Due to the potential for encountering MEC during ground disturbances, UXO clearance is conducted in accordance with AFMAN 32-3001 by qualified UXO personnel prior to beginning construction for projects on the island.

3.5.2.2 Mission Safety

USAF personnel, civilians, and contractors working and residing at WIA are required to conduct work in accordance with federal and USAF worker safety requirements, including OSHA, AFOSH, and the Mishap Prevention Program. Adherence to these standards aims to ensure the safety of all personnel working at USAF installations and protection of USAF property.

The existing Base Ops Facility is in an advanced state of failure due to corrosion, structural concrete spalling, and termite damage. Additionally, fire protection systems are inadequate and do not meet current codes. The facilities do not meet current USAF standards or AT/FP ABA criteria.

The medical clinic, DFAC, and other buildings associated with the CSF are Downtown within the historical rogue wave inundation zone and have suffered repeated flooding and storm damage. These facilities are in a state of advanced deterioration with structural issues from concrete spalling. The medical clinic poses a safety hazard for clinic personnel and patients due to aging electrical systems and mold. The clinic also lacks a garage for the ambulance, which must be parked outside where it is subjected to the corrosive effects of salt air. The DFAC does not have adequate freezer storage, requiring the use of freezers up to a mile away and making it difficult to maintain minimum food safety temperatures for transported items.

Inadequate air conditioning leads to extreme temperatures in the cooking areas that are hazardous to cooking staff.

The Base Living Quarters are also located Downtown where tropical storm surges have led to repeated building flooding. Fire protection systems in the living quarters are inadequate and do not meet current codes, and the high relative humidity at WIA has contributed to persistent mold growth. Additionally, buildings are in poor structural condition due to high ambient salinity, which causes premature failure of concrete and corrosion of metals. Portions of the existing facilities have been condemned due to falling ceilings, cracked and softened walls, mold growth within the mechanical systems and living areas, and water damage. The current situation is such that personnel at WIA are housed in inadequate facilities that pose a hazard to health and safety.

3.5.2.3 Flight Operations

The primary existing hazards at WIA relating to flight operations are associated with general flight operations and potential for aircraft mishaps; exposure to potential bird and/or wildlife strikes in the local flying area; exposure to noise from aircraft operations; and aircraft refueling and use of other hazardous materials for aircraft maintenance. Noise exposure and AICUZ for WIA are discussed in Section 3.2; hazardous materials management is discussed in Section 3.6.

The air traffic control room associated with the existing Base Ops Facility does not provide a 360-degree view of the airfield, because it is blocked by adjacent offices on the second floor of the building. Unobstructed airfield views are critical for safe aircraft operations, because air traffic controllers must be aware of airfield activities to be able to safely direct air crews and avoid aircraft mishaps. As described above, the Base Ops Facility is in an advanced state of disrepair, which puts personnel working within the facility, and thereby flight operations, at risk.

3.5.3 Environmental Consequences

Any increase in safety risks would be considered an adverse impact on safety. Impacts associated with health and safety would be considered significant if the proposed projects were to:

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

3.5.3.1 Proposed Action

Construction Safety

Due to the potential for encountering UXO at the project locations during ground disturbances, there would be a short-term, moderate, direct adverse impact on safety during the construction phase of the Proposed Action. To minimize this impact, it would be recommended that a UXO Plan be developed and a UXO Technician clear construction areas prior to commencing. It would also be recommended that a UXO Technician be available on WIA during ground-disturbing construction and demolition to be able to respond immediately to encounters with potential or actual UXO. Project personnel would follow BMPs for UXO safety. Implementation of minimization measures and adherence to USAF policies and procedures for management of UXO, in addition to proper planning and clearance of project areas in advance of construction, would greatly reduce the likelihood of encountering UXO.

Potential short-term, minor, direct adverse impacts on safety would be expected as a result of the Proposed Action from worker exposure to general safety risks associated with construction. Impacts would be minimized through adherence to established OSHA and USAF safety policies and procedures.

Based on this analysis, the execution of any or all of the projects under the Proposed Action would not substantially increase construction safety risks, hinder emergency services' ability to respond to an on-base emergency or introduce a new health or safety risk. By implementing minimization measures and following BMPs and safety policies and procedures, no significant impacts on construction safety would be expected.

Mission Safety

There would be no significant adverse impacts on mission safety from the Proposed Action. Construction of a new Base Ops Facility and CSF would result in a long-term, moderate, direct beneficial impact on overall mission safety through replacement of deteriorating, unsafe infrastructure with buildings that do not pose risk to the health and safety of workers and residents. Construction of a new medical clinic would include a garage for the ambulance, which would prevent equipment deterioration from exposure to the elements, thereby improving the installation's ability to respond to emergency situations. Adequate air conditioning and freezer storage at the new DFAC would provide safe working conditions for cooking staff and ensure that safe food temperatures are maintained for feeding installation personnel.

Flight Operations

There would be no significant adverse impacts on flight operations safety from the Proposed Action. Construction of a new Base Ops Facility, including an air traffic control room, would have a long-term, substantial, direct beneficial impact on flight operations safety. The new facility would eliminate safety hazards associated with the airfield visibility limitations of the current building. With improved visibility, air traffic controllers would be able to better direct air crews and aircraft, thereby reducing the risk of aircraft mishaps. Additionally, removing ironwood trees to prevent encroachment near the active runway and parking apron would deter vegetative growth in an established USAF safety setback area (PRSC 2022) and reduce BASH hazards for flight operations.

3.5.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and there would be no demolition of existing facilities or construction of new facilities. This would result in long-term, moderate to substantial, direct adverse impacts on safety and occupational health. Without construction of new Base Living Quarters, the availability of adequate housing for transient and permanent party personnel would continue to decrease, necessitating procurement of temporary housing. This would have an impact on mission readiness by making it increasingly difficult to attract qualified personnel due to poor living conditions and lack of facilities. Personnel living and working in the current facilities would continue to be exposed to unsafe conditions as the facilities continue to deteriorate. Working conditions in the existing Base Ops Facility and CSF would continue to deteriorate.

3.5.4 Cumulative Impacts

3.5.4.1 Construction Safety

It is expected that WIA would continue the trend of development, facility repairs, and renovations. Additionally, new construction projects will continue to be programmed for years to come. At the time of this analysis, 22 projects are scheduled through FY2027 and one project has an unknown timeline for execution. Some projects listed in Table 3.1-2 have the potential to overlap geographically and/or temporally with the Proposed Action. Consequently, there is potential for short-term, minor, cumulative adverse impacts on construction safety (e.g., slips, trips, falls, exposure to various construction site hazards) due to an increased number of workers exposed to hazards at a given time. Impacts would only last for the duration of the construction phases of projects. The Proposed Action and any future installation development projects would adhere to safe construction practices by complying with OSHA standards and USAF safety practices to minimize any risks and potential cumulative adverse impacts on safety. None of the impacts would be considered significant.

3.5.4.2 Mission Safety

There would be no significant cumulative adverse impacts on mission safety. Many of the WIA infrastructure projects planned for execution would improve mission safety by repairing or demolishing aging and unsafe buildings, thereby providing safe and healthful working and living environments for USAF personnel and contractors at WIA. When considered cumulatively, there would be an overall long-term, moderate, beneficial impact on mission safety as a result of the Proposed Action and other installation improvements described in Table 3.1-2.

3.5.4.3 Flight Operations

No significant cumulative adverse impacts on flight operations safety would be expected. Several apron and runway improvements are programmed for the coming years at WIA. When considered cumulatively, the overall impact on flight operations safety would be long-term, moderate, and beneficial, as each project targets a specific flight operations area that is currently deficient or does not meet safety standards.

3.6 Hazardous Materials and Hazardous Waste

3.6.1 Definition of Resource

3.6.1.1 Hazardous Materials and Hazardous Waste

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 (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR 173. Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) at 42 USC 6903(5), 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:

- Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness

- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Petroleum products include crude oil or any derivative thereof, such as gasoline, diesel, or propane. They are considered hazardous materials because they present health hazards to users in the event of incidental releases or extended exposure to their vapors.

Evaluation of hazardous materials and wastes focuses on the storage, transportation, handling, and use of hazardous materials, as well as the generation, storage, transportation, handling, and disposal of hazardous wastes. In addition to being a threat to humans, the improper release or storage of hazardous materials, hazardous wastes, and petroleum products can threaten the health and well-being of wildlife species, habitats, soil systems, and water resources.

Storage of bulk petroleum products is regulated federally under 40 CFR 112, Oil Pollution Prevention, for any facility with an aggregate storage of more than 1,320 gallons (gal) of oil. 40 CFR 112 requires facilities to develop an SPCC plan that describes spill response measures to be used in the event of a release.

3.6.1.2 Toxic Substances

Toxic substances are specific substances whose manufacture, processing, distribution, use, or disposal are restricted by the Toxic Substances Control Act (40 CFR 700-766), because they may present unreasonable risk of personal injury or health of the environment. They include asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs), and radon. In 1978, the DoD implemented a ban on LBP, and facilities constructed around or prior to this date are more likely to contain LBP. Radon is a naturally occurring, odorless and colorless, radioactive gas found in soil and rocks that can lead to the development of lung cancer. Radon tends to accumulate in enclosed spaces, usually those that are belowground and poorly ventilated (e.g., basements). EPA established a guidance radon level of 4 picocuries per liter (pCi/L) in indoor air for residences, and radon levels greater than this amount are considered a health risk to occupants. USAF policy is to prevent exposure at indoor radon levels greater than 4 pCi/L.

3.6.1.3 Contaminated Sites

In 1986, Congress created the Defense Environmental Restoration Program (DERP). DERP addresses the identification and cleanup of hazardous substances (Installation Restoration Program [IRP]) and military munitions (Military Munitions Response Program) remaining from past activities at military installations and Formerly Used Defense Sites. Through DERP, contaminated sites are investigated, and remedial actions are implemented in accordance with federal regulations found in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). When no further remedial action is necessary and it no longer represents a threat to human health, the site is closed.

Per- and polyfluoroalkyl substances (PFAS) are long-lasting chemicals that break down very slowly over time. Due to their widespread use and persistence in the environment, PFAS have been found in water, air, fish, and soil at locations globally. Studies have shown that exposure to PFAS in the environment may be linked to harmful health effects in humans and animals (EPA 2023b). In 2022, EPA issued a proposal to designate two of the most widely used PFAS as hazardous substances under CERCLA. EPA is proposing a National Primary Drinking Water Regulation to establish legally enforceable maximum contaminant levels for six PFAS in drinking water (EPA 2023c). PFAS contamination is of concern for areas where aqueous film-forming foam (AFFF) releases have occurred.

3.6.1.4 Unexploded Ordnance

As described in Section 3.5.1.1, AFMAN 32-3001 establishes the USAF EOD Program requirements (USAF 2022d).

3.6.1.5 Solid Waste

DoDI 4715.23, *Integrated Recycling and Solid Waste Management*, and AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, describe USAF requirements for waste management procedures. According to guidance, installations must establish, implement, and maintain an integrated solid waste management program to maximize the recovery or diversion of solid waste, to include construction and demolition debris, from landfills. Reuse, donation, recycling, composting, mulching, and other waste diversion activities are encouraged to optimize reduction in volume of waste disposed and overall cost of solid waste management.

3.6.2 Affected Environment

The generally affected environments for hazardous materials and hazardous waste analyses are the areas where existing buildings would be demolished and the new Base Ops Facility, CSF, and Base Living Quarters would be constructed.

3.6.2.1 Hazardous Materials

Oil containers used for storage at WIA include field-erected aboveground storage tanks, mobile refuelers, drums, and oil-filled operating equipment. There are no active underground storage tanks (USTs) at WIA. Petroleum products stored at WIA include jet propellant (JP)-5, motor gasoline (MOGAS), low-sulfur diesel (LSD), lubricant oil, and used oil. WIA receives all fuel by barge (USAF 2021).

The bulk fuel storage area is near the harbor. Fuel is pumped to an intermediate fuel farm consisting of two operational fuel storage tanks adjacent to former ramp space. Fuel is distributed from bulk storage to intermediate storage by a permanent pipeline running north of Taxiway Echo. There are hydrants on Parking Apron Alpha for aircraft fueling operations. All other refueling to tanks on Wake Island is performed via tanker truck (PRSC 2021a).

Shop areas including welding, maintenance, environmental, and other areas are located in buildings near the fuel farm. There are a number of drum storage locations in these areas, including hazardous materials storage and hazardous waste storage. Hazardous materials and waste are stored separately (USAF 2021).

3.6.2.2 Hazardous Waste

WIA is categorized as a RCRA large quantity generator and operates under RCRA Permit TTD987866035 (EPA 2023d). The WIA Hazardous Waste Management Plan (HWMP) provides base personnel with essential information for effective management of hazardous waste. The plan is used for hazardous waste release prevention and planning. The WIA SPCC Plan specifies that following a discharge, recovered product (excluding MOGAS and LSD) is tested by Liquid Fuels Management personnel to determine whether it can be reclaimed. Diesel fuel-contaminated PPE, sorbents, and soil are sent to the Solid Waste Disposal Area for incineration (USAF 2021).

Several satellite accumulation areas (SAAs) are located on the airfield, and B1403 is established as the 90-day accumulation point for hazardous waste prior to shipment off-island. Permitted waste haulers are contracted by the Defense Reutilization and Marketing Office to remove hazardous waste. Wastes are taken to a permitted treatment, storage, and disposal facility for recycling or disposal (USAF 2002).

3.6.2.3 Toxic Substances

Asbestos was used extensively for construction of buildings at WIA, as ACM was widely used during the timeframe in which they were built. Most ACM that presents potential hazards to personnel working and residing at WIA is placarded. Visual ACM surveys were conducted at 20 occupied buildings in 1987 and 67 occupied buildings in 1997. ACM was identified in roof and siding material, insulation, floor tiles, joints, and gaskets during those surveys. Sampling was not conducted during the surveys, which were limited to visual observations (USAF 2002).

Waste ACM was previously disposed of at a landfill on the southwestern side of Wilkes Island. The landfill is no longer in operation and is managed as IRP Site CD005 (USAF 2002).

LBP is suspected to be present at WIA facilities that were constructed prior to the 1978 ban. It is possible that facilities constructed immediately after the 1978 ban also contain LBP because supplies of paint had not yet been removed. A comprehensive LBP survey has not been conducted for WIA (USAF 2002).

Since 1986, sampling, characterization, and removal of potential PCB-containing transformers have been conducted at WIA (USAF 2002). In 1993, a remedial PCB site cleanup was conducted at a staging area at the WIA scrap metal accumulation site. The area was used for staging transformers with suspected PCBs. Transformers were sampled for PCBs, drained, and the fluids and empty transformers were packaged for shipment. No PCB-contaminated soil was found at the staging area (USAF 1993). Light ballasts in buildings are suspected to contain PCBs if the building was constructed prior to 1978, unless the lights have been retrofitted. A comprehensive PCB survey has not been conducted for WIA (USAF 2002).

EPA has developed a map of radon zones for the U.S.; however, this information is not available for Wake Island, nor has a comprehensive radon survey been conducted for WIA (USAF 2002). The natural ventilation and lack of basement living quarters in WIA facilities suggest that radon may not be a significant health consideration.

3.6.2.4 Contaminated Sites

LUCs are a strategy applied at environmental restoration sites to restrict exposure to contaminant concentrations that present unacceptable risk to human health or the environment. The USAF LUC Management Plan (USAF 2019b) identifies the LUCs in place for these sites and documents responsibilities and procedures for maintaining, managing, tracking, enforcing, and (when appropriate), modifying or terminating the LUCs. Administrative approval processes for intrusive activities and land use changes at sites with LUCs include DoD Form 1391, Description of Proposed Construction; Air Force Form (AFF) 332, Base Civil Engineer Work Request; and AFF 103, Base Civil Engineer Work Clearance Request, or local equivalent. When these forms are submitted, notification is made to Air Force Civil Engineer Center environmental restoration personnel who then evaluate the proposed activities and land use changes at sites before granting approval. The review process ensures that activities comply with LUCs (USAF 2019b). Currently there are six IRP sites with LUCs and one landfill at WIA (Figure 3.6-1). There are a total of 82 closed sites. Table 3.6-1 presents a summary of the seven open IRP sites.

There are no known IRP sites in the vicinity of the proposed new CSF and Base Living Quarters project. Site ST032, Runway Staging Area USTs, composed of seven subsites (ST032A through ST032G) overlaps the siting locations for the proposed Base Ops Facility and parking apron. Subsite ST032G overlaps the siting location for the proposed Base Ops Facility. Subsites ST032C, ST032D, ST032E, and ST032F overlap or are in proximity to the proposed parking apron. LUCs in place for ST032 restrict the area to industrial use only and require soil and groundwater sampling should a change in land use be proposed. There are also limitations and controls on future excavations at the site; intrusive activities and site redevelopment require USAF approval.

A 2019 site inspection of AFFF spray test areas sampled surface soil at various locations between the airport and industrial areas on WIA for PFAS chemicals perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS). Results were non-detect or less than the screening levels for the sampled contaminants (USAF 2020). Sampling locations overlapped with areas that are within the proposed parking apron and Base Ops Facility ROI.

Table 3.6-1 Installation Restoration Program Sites at Wake Island Airfield

SITE ID, NAME	DESCRIPTION	LUCs IN EFFECT	POTENTIALLY AFFECTED PROJECTS
CD005, EA05 – Wilkes Asbestos Landfill	In 1993, ACM from a demolished building was buried. Landfill is unlined and covered with earthen material.	Warning signage indicating presence of ACM landfill. Limit excavation, grading, or trenching to avoid damage to vegetated soil cover.	None
OT010, Peacock Point Burn Area 1	7.5-acre site. Inactive waste disposal and burn area that was operated from the 1960s through at least 1991. A portion of the site extends into the intertidal reef flat where burned wastes were disposed.	Protect intertidal invertebrate communities from exposure to contaminated waste fused metal debris pile. Prevent continued leaching of contaminants from fused metal debris pile. Prevent continued erosion and migration of contaminated waste from fused metal debris pile to marine environment. Prevent consumption of contaminated fish. Protect marine environment and associated objects of historic or scientific interest, fish and wildlife resources, and habitats from releases of environmental contaminants.	None
OT012, Installation Road System	Comprises six subsites. Between 1947 and 1984, unpaved roadways were sprayed with waste oils and waste fluids for dust control. Solvents, motor oil, engine oil, refrigeration oil, hydraulic and brake fluids, and motor vehicle gasoline were reportedly used.	None specified.	None
OT013, Scrap Metal Pile #2 and Burn Area	20-acre site, used as a scrap metal disposal and staging area since late 1950s. Wastes and materials found include abandoned vehicles, equipment, storage tanks, aircraft parts, batteries, demolition debris, electrical transformers, and 55-gal drums.	No residential land use. No removal of site soil for uncontrolled use elsewhere. OT013 LUCs are managed by units; some units are closed (no LUCs) and one remaining unit has LUCs in effect.	None
ST032, ST32 Runway Staging Area USTs	31 former and inactive USTs grouped in 7 separate subsites (ST032A through ST032G). POL	No residential use, industrial use only; required groundwater and soil sampling for proposed changes in land use.	Proposed Base Ops Facility

Table 3.6-1 Installation Restoration Program Sites at Wake Island Airfield

SITE ID, NAME	DESCRIPTION	LUCs IN EFFECT	POTENTIALLY AFFECTED PROJECTS
	contamination has resulted from leaks and tank usage. Media of concern: surface and subsurface soil, shallow groundwater, soil vapor.	Limitations and controls on future excavations. Approval required for redevelopment and intrusive activities.	Proposed parking apron
ZZ011, IRP Site OT11	Site reportedly received waste solvents, oils, and paints from the industrial shop. Debris was dumped at the site, then burned and bulldozed.	Final remedy: soil excavation and disposal.	None
ID050, Peale LORAN Station	Wastes include miscellaneous metal, equipment, vehicle parts, glass, reportedly contains transformers.	None specified.	None

Notes:
For definitions, refer to the Acronyms and Abbreviations list.
Source: USAF 2011, 2015, 2019b.

3.6.2.5 Unexploded Ordnance

A discussion of UXO and MEC at WIA is presented in Section 3.5.2.1.

3.6.2.6 Solid Waste

Solid waste generated on Wake Island is collected and transported via truck to the island's solid waste accumulation area south of the runway. Plastics, aluminum, and cardboard are the waste streams targeted for recycling. Waste segregation is performed at the point of generation and in the processing yard. Solid waste is processed through one of two incinerators, with each incinerator having the capacity to process approximately 3,500 pounds of trash per cycle. The entire incineration process takes approximately 18 hours, and the resulting ash is typically 10% of the initial material volume, which is then loaded into quick sacks and staged within the waste yard for shipment off-island. Current steady-state operations on the island generate solid waste quantities requiring an incinerator waste processing cycle (3,500 pounds) once every 3 to 4 days (PRSC 2021a).

The WIA Solid Waste Management Action Plan defines the various elements of the waste stream, documents current solid waste disposal and management practices, and identifies alternative disposal methods (USAF 2021). Approximately 101 tons of municipal solid waste, 586 tons of construction-demolition debris, and an undetermined amount of scrap metal are generated annually (USASMDC 2000, as cited in USAF 2002).

1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

ACTIVE INSTALLATION RESTORATION PROGRAM SITES

Legend

- IRP Sites
- Proposed New Parking
- Proposed New Base Operations Facility
- Proposed New CSF and Base Living Quarters

Abbreviations

CSF	Consolidated Support Facility
IRP	Installation Restoration Program

Notes

1. For conceptual purposes only. All locations are approximate.
2. IRP site boundaries for CD005, ID050, ST032F, and ZZ011 sourced from Figure 42, Air Force Civil Engineer Center (AFCEC). 2019. Land Use Control Management Plan Pacific Air Forces Regional Support Center Remote Installations. August.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. IRP restoration datasets provided from AFCEC: 07/18/2023.
3. Proposed project features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

2,500 1,250 0 2,500 5,000

Feet

PROJECT No.: 321804	DATE: 9/6/2023	FIGURE:
P.M.: S.B.	DRAWN: T.A.	**3.6-1**

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3.6.3 Environmental Consequences

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

3.6.3.1 Proposed Action

Hazardous Materials

Short-term, minor, direct adverse impacts associated with the use of hazardous materials and petroleum products would occur during the construction, renovation, and demolition phases of the Proposed Action. Paints, welding gases, solvents, preservatives, sealants, and fuels may be used during construction. Prior to shipping material to Wake Island, the contractor would provide a list of hazardous materials to be used for the construction and demolition of buildings to the 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE) Hazardous Materials/Hazardous Waste (HM/HW) Manager.

Long-term, minor, direct adverse impacts on the quantity of hazardous materials stored in the ROI would occur from the Proposed Action. Two generators would be installed to provide backup power for the new Base Ops Facility and CSF. The diesel fuel capacity of each generator is undetermined at the time of this analysis. There would be additional small quantities of lubricants, fuel, herbicide, rodenticide, and paints stored at the new facilities for base operations, maintenance, and infrastructure support. Hazardous materials would be managed through the 611 CES/CEIE HM/HW Manager, and equipment with a fuel capacity of 55 gallons or more would be incorporated into the existing SPCC Plan, as required by 40 CFR 112; consequently, no significant adverse impacts would be expected from hazardous materials.

Hazardous Waste

Short-term, minor, direct adverse impacts from hazardous waste would occur during the construction and demolition phases of the Proposed Action. A designated hazardous waste/universal waste SAA would be identified for use during this phase. The SAA would be managed in accordance with a hazardous waste/universal waste management plan approved by the 611 CES/CEIE HM/HW Manager and the WIA HWMP. The SAA would be inspected daily and recorded by the contractor. Inspections would be provided weekly to the HM/HW Manager. All construction- and demolition-generated hazardous waste and universal waste would be shipped off-island for proper disposal. There are no identified locations currently for hazardous waste accumulation areas or SAAs at new facilities associated with the Proposed Action (USAF 2023b). No significant adverse impacts would be expected from hazardous waste.

Toxic Substances

Due to the age of structures, LBP is a potential concern. A representative sample for lead would be taken from each building to determine if the building debris would be over the 5-milligrams-per-liter threshold for leachable lead using the Toxicity Characteristic and Leaching Procedure (TCLP) method. Debris exceeding this threshold would be shipped off-island to an approved hazardous waste RCRA disposal facility. Debris less than the threshold would be shipped off-island to an approved landfill.

Soil samples would be taken from buildings where LBP is identified as a concern. If soil samples contain 100 milligrams per kilogram or more of total lead, samples would undergo TCLP analysis to determine waste characteristics and proper disposal. For soil samples where total lead is greater than 400 milligrams per kilogram, the soil would be removed and shipped to an approved landfill. Soil samples with a TCLP result greater than 5 milligrams per liter would be removed and shipped to an approved hazardous waste disposal facility, regardless of total lead results.

Surveys, testing, and removal would be performed to assess whether ACM is present in buildings that would be affected by construction and demolition. ACM would be stored appropriately and disposed of offsite at an authorized landfill.

There would be short-term, negligible, direct adverse impacts from potential encounters or worker exposure to toxic substances during construction and demolition; however, toxic substances would be handled in accordance with federal and USAF regulations, which would ensure all necessary precautions are in place to protect human health and the environment. These impacts would last for the duration of construction and demolition. The long-term impacts from the Proposed Action would be minor to moderate, direct, and beneficial for workers and residents of WIA. The Proposed Action would eliminate exposure pathways for ACM, LBP, PCBs, and radon by demolishing existing aging facilities that may contain these toxic substances and replacing them with modernized buildings.

Contaminated Sites

The results of the 2019 surface soil sampling in the vicinity of the proposed Base Ops Facility and parking apron suggest that PFAS would not be encountered during the construction of this infrastructure. It is possible that POL-contaminated soil could be encountered during construction of these two facilities due to the siting location overlap with IRP Site ST032. The administrative approvals process implemented by the LUC Management Plan would be followed for all projects associated with the Proposed Action and would protect human health and the environment from exposure to unacceptable concentrations of contaminants. Construction projects would have approved health and safety plans as well as proper PPE. If suspected contamination were to be encountered during construction and demolition, work would be stopped, and appropriate USAF and agency notifications would be made. The Proposed Action would be expected to have short-term, negligible to minor, direct adverse impacts from working in and around existing contaminated sites; adherence to established procedures described in this section would minimize these adverse impacts. There could be long-term, negligible to minor, direct beneficial impacts if contaminated soil were removed during projects. Excavation of soil would remove a contaminant source, thereby eliminating potential exposure pathways.

Unexploded Ordnance

Impacts from potential encounters with UXO are presented in Section 3.5.3.1.

Solid Waste

There would be short- and long-term, minor, direct adverse impacts from construction and demolition debris generated from the projects. This debris would be managed and disposed of in accordance with the WIA Solid Waste Management Action Plan. Except for concrete, construction debris would be staged at an accumulation area and transported off-island by barge. There would be no significant adverse impacts related to solid waste.

3.6.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not take place and there would be no demolition of existing facilities or construction of new facilities. There would be no impacts from hazardous materials onsite for construction or operation of new facilities, and there would be no hazardous wastes generated from demolition of existing structures with LBP, ACM, or PCBs. Structures containing toxic substances would remain operable, exposing personnel and contractors to potentially unhealthful working conditions. Existing contaminated sites would remain un-impacted, and there would be no potential for excavation and disposal of contaminated soil from construction. No solid waste or construction debris would be generated. Due to the continued presence of toxic substances, the No Action Alternative would result in long-term, minor, direct adverse impacts due to the continued exposure of USAF personnel and contractors to toxic substances.

3.6.4 Cumulative Impacts

3.6.4.1 Hazardous Materials

The addition of hazardous materials from the Proposed Action and RFFAs described in Table 3.1-2 has the potential for short-term cumulative adverse impacts from the use of hazardous materials during the construction phases of projects. These impacts would be minor to moderate, depending on how many of the projects were executed concurrently. In the long-term, the potential additional fuel storage to support backup generators associated with the Proposed Action represents a negligible increase when compared to the bulk fuel storage tank projects that are planned for WIA. Risks associated with hazardous material storage and usage would be minimized by ensuring that additional fuel capacity is captured under the WIA SPCC Plan and managed in accordance with 40 CFR 112 and other applicable federal regulations, AFI and AFMAN, and industry codes, standards, and guidance such as American Petroleum Institute, Steel Tank Institute, National Fire Protection Association, and UFC. Consequently, the long-term cumulative adverse impacts from fuel storage would be expected to be minor.

3.6.4.2 Hazardous Waste

For those projects that would occur concurrently with the Proposed Action, there would be short-term cumulative adverse impacts from construction sites requiring hazardous waste accumulation areas or SAAs. These areas would be managed in accordance with the WIA HWMP, and waste management plans would be required to be approved by the 611 CES/CEIE HM/HW Manager. With adherence to established plans and procedures, these adverse impacts would be minor to negligible.

3.6.4.3 Toxic Substances

When considered cumulatively with the Proposed Action, RFFAs have the potential to result in short-term, minor, cumulative adverse impacts from unknown quantities of ACM, LBP, and PCB wastes from demolition and/or renovation of existing facilities that contain such materials. Samples from buildings and soil around buildings would be taken prior to construction, demolition, and renovation projects to identify materials that would require disposal at an approved facility. As aging infrastructure is renovated or demolished, ACM, LBP, and PCBs would be removed from the installation, thereby removing the human exposure pathway, and resulting in a long-term, moderate, cumulative beneficial impact.

3.6.4.4 Contaminated Sites

There may be long-term, moderate, cumulative beneficial impacts from the Proposed Action and RFFAs due to the potential for removal of contaminated soil at existing IRP sites overlapping with planned projects involving excavation. As contaminated soil is removed, the potential for human exposure is decreased or eliminated.

3.6.4.5 Unexploded Ordnance

As described in Section 3.5, UXO clearance must be conducted in accordance with AFMAN 32-3001 by qualified UXO personnel prior to beginning construction for projects on the island due to the potential for encountering MEC during ground disturbances. This would result in short-term, minor, cumulative adverse impacts from the potential presence of MEC and multiple concurrent projects. The risks would be mitigated by following established policies and procedures for safely conducting construction.

3.6.4.6 Solid Waste

Solid wastes generated from the Proposed Action, when considered cumulatively with other planned projects, would result in short- and long-term, minor, cumulative adverse impacts and would not be expected to cause a significant impact regarding solid waste. Construction and demolition debris generated from the projects would be managed and disposed of in accordance with the WIA Solid Waste Management Action Plan. Debris that cannot be recycled or incinerated would be staged at an accumulation area prior to being barged offsite for disposal.

3.7 Biological/Natural Resources

3.7.1 Definition of Resource

3.7.1.1 Biological Resources

Biological resources include native or naturalized plants and animals and the habitats in which they exist (e.g., grasslands, forests, and wetlands). Protected and sensitive biological resources include species listed as threatened or endangered under the ESA and those proposed for listing as designated by the USFWS and the NOAA-National Marine Fisheries Service (NMFS); migratory birds protected under the Migratory Bird Treaty Act (MBTA); and bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA).

Sensitive habitats include ESA-designated critical habitat and sensitive ecological areas designated by state or other federal rulings; wetlands; plant communities that are unusual or limited in distribution; and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats).The following sections present a detailed description of the regulatory framework used to evaluate the ROI and the potential impacts of the project alternatives.

Marine Mammal Protection Act

Proposed activities that occur in coastal and open water areas may also be affected by the Marine Mammal Protection Act (MMPA) of 1972 (16 USC 1361 *et seq.*), as amended through 1997. The MMPA established a federal responsibility to conserve marine mammals and associated essential habitats in U.S. waters, by placing, with limited exceptions including for military readiness activities, a moratorium on the “taking” of marine mammals in waters or on lands under U.S. jurisdiction. Management of the MMPA is vested in NOAA-NMFS for cetaceans (whales and dolphins) and for pinnipeds (seals and sea lions) other than walrus. USFWS is responsible for other marine mammals, including sea otter, walrus, polar bear, dugong, and manatee.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA; Public Law 94-265) is the primary law that fosters the long-term biological and economic sustainability of marine fisheries in federal waters. Its objectives include preventing overfishing, rebuilding overfished stocks, increasing long-term economic and social benefits, and ensuring a safe and sustainable supply of seafood.

In 1976, the MSA extended U.S. jurisdiction over waters off its coast to 200 nautical miles and established eight regional fishery management councils to govern the management and conservation of fisheries in federal waters. The Western Pacific Regional Fishery Management Council has authority over fisheries seaward of state/territorial waters of Hawaiʻi and the U.S. Pacific Islands, including Wake Island. The marine water column from the surface to a depth of 1,000 meters (3,000 feet) from the shoreline to the outer boundary of the Exclusive Economic Zone (the zone where the U.S. and other coastal nations have jurisdiction over natural resources; 230 miles), and the seafloor from the shoreline out to a depth of 100 meters (300 feet) around Wake Island have been designated as essential fish habitat (EFH; Western Pacific Regional Fishery Management Council 2009a, 2009b). As such, the water column and bottom of the nearshore Pacific Ocean surrounding Wake Atoll are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council Fishery Ecosystem Plans for Pacific Pelagic Fisheries of the Western Pacific Region and Pacific Remote Island Areas.

Endangered Species Act

The ESA (16 USC 1531 *et seq.*) established a federal program to protect and recover imperiled species and the ecosystems upon which they depend. The ESA requires federal agencies, in consultation with the USFWS and NOAA-NMFS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The ESA also prohibits any action that causes "take" of any listed animal. To take means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

Critical habitat is habitat that is essential to the conservation of threatened or endangered species. Federal agencies must ensure that their activities do not adversely modify designated critical habitat to the point that it will no longer aid in species recovery.

Migratory Bird Treaty Act and EO 13186

The MBTA of 1918 (16 USC 703-712), as amended, and EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, require federal agencies to conserve migratory bird populations. Unless otherwise permitted by regulations, the MBTA makes it unlawful to (or attempt to) pursue, hunt, take, capture, or kill any migratory bird, nest, or egg. Each federal agency that takes actions that could have measurable negative impacts on migratory birds is directed by EO 13186 to develop and implement a Memorandum of Understanding with USFWS to promote the conservation of migratory bird populations.

Bald and Golden Eagle Protection Act

Bald and golden eagles are protected under the BGEPA (16 USC 668-668c), which prohibits the "take" of bald or golden eagles in the U.S. without a 50 CFR 22.26 permit. BGEPA defines "disturb" as "to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause: (1) injury to an eagle;

(2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition covers impacts from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

Sikes Act

The Sikes Act (16 USC 670a) applies to federal land under DoD control and, among other things, requires military services to establish Integrated Natural Resource Management Plans (INRMPs) to conserve natural resources on military installations. INRMPs include inventories and evaluations of threatened and endangered species, other fish and wildlife resources, wetlands, migratory bird habitat, and forest lands on each installation. INRMPs assess the impact of military activities on natural resources and the means to mitigate these impacts. The INRMP includes habitat improvements or modifications, wildlife considerations in range rehabilitation, control of off-road vehicle traffic, consumptive and non-consumptive use and protection of fish and wildlife resources, natural resources law enforcement requirements, and designated responsibilities for the control and disposal of feral animals. Coordination with USFWS ensures the INRMP complies with and supports federal and state natural resource-related laws and mandates.

EO 13089, Coral Reef Protection

EO 13089 directs federal agencies to protect and enhance the conditions of coral ecosystems when proposing actions that could result in impacts on these habitats. Federal agencies whose actions affect U.S. coral reef ecosystems shall provide for implementation of measures needed to research, monitor, manage, and restore affected ecosystems, including, but not limited to, measures reducing impacts from pollution, sedimentation, and fishing. These measures shall be developed in cooperation with the U.S. Coral Reef Task Force (co-chaired by the Secretary of the Interior and the Secretary of Commerce through the Administrator of NOAA) and fishery management councils and in consultation with affected state, territorial, commonwealth, Tribal, and local government agencies, non-governmental organizations, the scientific community, and commercial interests.

Presidential Proclamations 8336 and 9173, Establishment and Expansion of the Pacific Remote Islands Marine National Monument

On 6 January 2009, Presidential Proclamation 8336 established the PRIMNM. The Monument encompasses seven islands and atolls: Baker, Howland, and Jarvis Islands; Johnston, Wake, and Palmyra Atolls; and Kingman Reef; and includes the waters and submerged lands of the Pacific Remote Islands to 50 nautical miles. Presidential Proclamation 8336 prohibits commercial fishing within the Monument, but gives the Secretary of Commerce, through NOAA, primary responsibility for managing fishery-related activities 12 to 50 nautical miles from the islands. On 25 September 2014, Presidential Proclamation 9173 extended the PRIMNM boundaries at Wake Atoll (and subsequently Wake Island National Wildlife Refuge), Jarvis Island, and Johnston Atoll to 200 nautical miles.

A Special Use Permit would be required for conducting marine activities such as in-water work and vessel movements in the PRIMNM. The permit would comply with the typical special conditions and requirements for Special Use Permits (USFWS 2023a) applicable to the Proposed Action as determined by the USFWS PRIMNM Superintendent and the 611 CES in accordance with the ESA/EFH consultation(s) (Appendix A).

Amendment No. 1 to Secretary of the Interior Order 3284, Delegation of Management Responsibility for the Pacific Remote Islands Marine National Monument, Rose Atoll Marine National Monument and the Marianas Trench Marine National Monument

On 31 August 2016, Secretary of the Interior Order 3284, Amendment No. 1 assigned the Director of the Interior to manage the waters and the submerged lands of the PRIMNM and its expansion as a unit of the National Wildlife Refuge System (Wake Island National Wildlife Refuge). The Director shall not commence management of the emergent lands at Wake Island, and the Department of the Air Force shall continue to manage such emergent lands according to the terms and conditions of the 1972 Agreement between the Secretary of the Air Force and the Secretary of the Interior unless and until such Agreement is terminated.

Executive Memorandum on Conserving the Natural and Cultural Heritage of the Pacific Remote Islands

On 17 April 2023, at the direction of the President, the NOAA Office of National Marine Sanctuaries (ONMS) issued a Notice of Intent to Conduct Scoping and to Prepare an EIS for the Proposed Designation of a National Marine Sanctuary for the Pacific Remote Islands. The proposed national marine sanctuary would include the marine areas within the existing PRIMNM as well as currently unprotected submerged lands and waters to the full extent of the U.S. Exclusive Economic Zone, an area totaling approximately 770,000 square miles. At the time of this analysis, ONMS is reviewing public comments and preparing a draft management plan, EIS, proposed regulations, and proposed boundaries.

3.7.1.2 Natural Resources

Natural resources are materials from the earth that are used to support life and meet people's needs by supplying food, fuel, and raw materials to produce goods. Natural resources include water resources (wetlands, groundwater, floodplains, and surface waters, discussed in Section 3.4), gravel, coal, petroleum, coastal zone management, solar resources, and training/recreational spaces.

CEQ regulations (40 CFR 1502.16) require federal agencies to consider energy requirements, natural depletable resource requirements, and the conservation potential of alternatives and mitigation measures when evaluating a proposed action. Statues and Eos related to natural resources and energy supply are listed in Table 3.7-1.

Table 3.7-1 Natural Resources and Energy Supply Statutes and Executive Orders

STATUTE/EO	DESCRIPTION
Energy Independence and Security Act	Under this act (Public Law 110-140), federal agencies are required to take actions to move the U.S. toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the federal government.
Energy Policy Act	The Energy Policy Act (42 USC 13201 *et seq.*) requires federal agencies to take actions to ensure jobs for our future with secure, affordable, and reliable energy. The Energy Policy Act contains provisions that address energy production, including energy efficiency; renewable energy; oil and gas; coal, Tribal energy, nuclear matters, and security; vehicles and motor fuels; energy tax incentives; hydropower and geothermal energy; and climate change technology.
EO 13834	EO 13834, Efficient Federal Operations, requires federal agencies to meet energy and environmental performance statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. Agencies are tasked to prioritize actions that reduce waste, cut costs, and enhance the resilience of federal infrastructure and operations.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.

3.7.2 Affected Environment

The ROI includes the portions of Wake Island where construction, demolition, and renovation projects under the Proposed Action would occur on the installation.

3.7.2.1 Biological Resources

Vegetation

The harsh climate, inhospitable substrate (low-fertility coarse-grained disintegrated coral interspersed with coral cobble), and regime of frequent, catastrophic disturbances from tropical storms and typhoons combine to maintain the natural vegetation in an early successional stage. The lack of soil, soil nutrients, and organic matter is made more inhospitable by rapid drainage through the porous calcareous substrate in undeveloped areas. Ecologically, the indigenous plant species can be pioneer species with broad ecological tolerance for high salinity, droughty conditions, and frequent disturbance. The natural plant associations occurring on the unimproved grounds of Wake Atoll, based loosely on a moisture gradient, are as follows (Table 3.7-2).

Table 3.7-2 Plant Associations of Wake Atoll

ECOLOGICAL CONDITIONS	SPECIES	DESCRIPTION
Xeric (dry)	*Tournefortia argentea* (tournefortia)	Tournefortia forest occurs on coral rubble and shell substrates. It is the most widespread of the native trees on the Wake Atoll, usually the first woody plant to occur on the cobble beaches of the windward, northeastern sides of Peale and Wake Islands. Tournefortia appears to thrive in some of the least fertile, most xeric conditions on the atoll. Along the beach, they often occur as neatly rounded shrubs reaching 3 to 6 feet in height. Mature trees seldom exceed 20 feet in height. In these locations, *Cordia subcordata* (cordia) is a common associate, especially in the slightly lower areas where the remnants of Japanese WWII defensive structures are still evident. Presumably, these somewhat lower areas accumulate some organic matter and may retain some moisture.
Mesic (medium)	*Cordia subcordata* (cordia)	Cordia is a small to medium sized tree native to the Pacific that grows to an average height of 23 to 33 feet. This tree prefers warm coastal areas on the leeward side of islands but can tolerate semi-moist inland areas.
Hydric (wet)	*Pemphis acidula* (pemphis)	Pemphis is a closely branched shrub with very hard wood found on water-saturated sandy substrates. It is the predominant species lining the lagoon margin on Wake, Wilkes, and Peale Islands. It also persists inland on the drier sandy flats that adjoin the lagoon along the edges of the brackish ponds, where it occupies the saturated zone immediately adjacent to the open water. The most common associate is *Sesuvium portulacastrum* (seaside purslane), a mat-forming, fleshy shrub common along the saturated zone of the lagoon on all three islands and the edges of the brackish ponds on Wake and Wilkes Islands.
Unspecified	*Casuarina equisetifolia* (casuarina) forests; ruderal vegetation; mowed/maintained areas	Casuarina (ironwood) forests are characterized by low species richness and diversity. It has allelopathic properties, so it is able to prevent seed germination in other species. As a result, the forest rapidly progresses toward being a monoculture. While casuarina forests provide nest sites for arboreal nesting birds, they preclude the ground nesting species. Where ironwood invades sandy beaches, their dense root structure prevents sea turtles from digging burrows.

Table 3.7-2 Plant Associations of Wake Atoll

ECOLOGICAL CONDITIONS	SPECIES	DESCRIPTION
Unspecified (cont'd)	*Casuarina equisetifolia* (casuarina) forests; ruderal vegetation; mowed/maintained areas (cont'd)	Ruderal (colonizing) vegetation is found in disturbed or altered habitats that typically receive occasional mowing or other disturbance. Ruderal areas support mostly introduced or weedy plant species and are found primarily on Wake Island on semi-improved grounds. At these locations, the ground cover is generally over 50% with bare shell/coral/sand substrate clearly visible. Mowed/maintained vegetation occurs in areas where routine grounds maintenance and mowing occur; primarily on Wake Island (e.g., airfield, housing areas, and adjacent to roads). Like ruderal areas, mowed/maintained areas support mostly introduced or weedy plant species. Ground cover in the mowed/maintained areas is generally over 50% with bare shell/coral/sand substrate clearly visible.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USAF 2023d.

Ironwood is an aggressive invasive plant that tends to crowd and shade out native vegetation. It also has allelopathic properties, preventing seed germination of other species. As a result, ironwood forests rapidly progress to monocultures characterized by low species richness and diversity. A full list of vegetation species on Wake Island, including invasive plant species, is provided in Table 14-1 of WIA INRMP Appendix C (USAF 2023d).

Wildlife

Wildlife on Wake Atoll is dominated by a diversity of migratory seabirds, shorebirds, and waterfowl. There are no indigenous mammals on Wake Atoll. Two species of rats, the Pacific rat (*Rattus exulans*) (also referred to as the Polynesian rat) and the Asian house rat (*Rattus tanezumi*), were inadvertently introduced to Wake Atoll. Polynesian rats are thought to have been introduced to the atoll by early Micronesian explorers. The Asian house rat is thought to have been introduced by Vietnamese refugees during the 1970s, when it was observed that associated cargo was contaminated with rats. The Polynesian rat (in particular) and the Asian house rat became extremely abundant throughout Wake Atoll. Rats are known to prey upon seabird eggs and chicks, native plants, and other invertebrates, and have caused the extinction and extirpation of multiple species worldwide. They also cause damage to arrestor tapes, buildings, and other infrastructure; contaminate food stores; and can pose a potential health threat (USAF 2023d).

There are no amphibians known to inhabit Wake Island. Reptiles found on Wake Island include the mourning gecko (*Lepidodactylus lugubris*), the stump-toed gecko (*Gehyra mutilata*), the house gecko (*Hemidactylus frenatus*), the snake-eyed skink (*Cryptoblepharus boutonii*), and the azure-tailed skink (*Emoia cyanura*). The mourning gecko is common on Wake Atoll. It has a characteristic black bar that extends along each side of the head from the snout through the eye and onto the neck and wavy chevron markings that vary in intensity and extend down its back. The tail is slightly flattened and has a distinct angular edge along its side. The species is common in habitats that furnish cover from direct sunlight, and it is often active during the day in reduced light conditions inside structures (USAF 2023d).

A variety of crabs are present at Wake Atoll, including the strawberry hermit crab (*Coenobita perlata*), thin-shelled rock crab (*Grapsus tenuicrustatus)*, and blackback land crab (*Gecarcinus lateralis*). Strawberry hermit crabs are terrestrial hermit crabs that are present in most habitats, and they are often found in the shade during the day. They feed nocturnally on any available food and commonly scavenge in garbage. They eat decaying material such as dead fish and rats. They also eat the rodenticides in rat bait stations and have been observed eating bird eggs and chicks on Wilkes Island (USAF 2023d). Thin-shelled rock crabs are common in the intertidal zone.

Arthropods found on Wake Atoll include spiders, beetles, springtails, biting midges, fruit flies, wasps, ticks, moths, leaf miners, crickets, scorpions, and four species of invasive ant.

The atoll lagoon supports a large population of fish, and the surrounding reefs host a diverse assemblage of reef fish, including sharks. Nearshore fish important for food and recreational purposes include groupers (*Epinephelinae*), porgies (*Sparidae*), and jacks (*Carangidae*) (USAF 2023d).

Surveys from 1999 and 2007 recorded 32 resident, migrant, visitor, vagrant, accidental, and exotic bird species on Wake Atoll. A complete list of birds that have been documented on Wake Atoll is provided in Appendix C of the WIA INRMP (USAF 2023d).

Table 3.7-3 lists wildlife species observed in the ROI during a survey of biological resources between 9 to 24 March 2023. Several insects were also observed: large carpenter bee (*Xylocopa latipes*), moth/butterfly (*Lepidoptera*), dragonfly (*Anisoptera*), black fly (*Diptera*), and spider (*Araneaeomorphae*). Aside from the large carpenter bee, their exact species were difficult to discern.

Table 3.7-3 Wildlife Observed During Biological Resources Survey (March 2023)

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION	LOCATION(S) IN RELATION TO ROI
Pacific rat	*Rattus exulans*	Also known as Polynesian rats, this species is thought to have been introduced to the atoll by early Micronesian explorers. Rats are known to prey upon seabird eggs and chicks, native plants, and other invertebrates, and have caused the extinction and extirpation of multiple species worldwide. They also cause damage to arrestor tapes, buildings, and other infrastructure; contaminate food stores; and can pose a potential health threat.	All project siting locations including Downtown
Mourning gecko	*Lepidodactylus lugubris*	The mourning gecko is common on Wake Atoll. Females can reproduce even in the absence of males and any adult female can establish a population. The species is common in habitats that furnish cover from direct sunlight, and it is often active during the day in reduced light conditions inside structures.	Downtown and outside ROI near proposed CSF and Base Living Quarters at Pond 1 (Figure 3.4-1); observed near water and on sides of buildings
Strawberry hermit crab	*Coenobita perlatus*	Very common at Wake Atoll, the strawberry hermit crab is a terrestrial hermit crab that is present in most habitats and often found in the shade during the day. They feed nocturnally on any available food and commonly scavenge in garbage. They eat decaying material such as dead fish and rats; they also eat the rodenticides in rat bait stations and have been observed eating bird eggs and chicks on Wilkes Island.	All project siting locations including Downtown; commonly observed in ironwood stands
Thin-shelled rock crab	*Grapsus tenuicrustatus*	The thin-shelled rock crab is common in the intertidal zone.	Outside ROI near proposed Base Ops Facility; commonly observed along shoreline where ocean meets land

Table 3.7-3 Wildlife Observed During Biological Resources Survey (March 2023)

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION	LOCATION(S) IN RELATION TO ROI
Blackback land crab	*Gecarcinus lateralis*	The blackback land crab is an edible crab found on Wake Atoll. INRMP Objective FWM-3 is to conduct land crab surveys on Wake Atoll to develop an understanding of species composition, track changes in population dynamics, assist with understanding rodent bait survival, and identify the potential introduction of new land crab species onto Wake Atoll.	Downtown and outside ROI near proposed parking apron (south end of Parking Apron Alpha)
Mullet	*Mugilidae sp.*	A common reef fish species often observed in the atoll's lagoon.	Outside ROI near proposed CSF and Base Living Quarters at Pond 2 (Figure 3.4-1)

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USAF 2023d.

Protected and Sensitive Species

Marine Mammals

MMPA-protected marine mammals that may be present in the open ocean surrounding Wake Atoll include several species of cetaceans: blue whale (*Balaenoptera musculus*; endangered), finback whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), Cuvier's beaked whale (*Ziphius cavirostris*), and sperm whale (*Physeter catodon*; endangered). Bottlenose dolphins (*Tursiops runcates*) and spinner dolphins (*Stenella longirostris*) may also be present in the area. Hawaiian monk seals (*Monachus schauinslandi*; endangered) were historically documented on an occasional basis; however, there have been no reports of sightings in the past two decades (USAF 2023d).

Essential Fish Habitat

EFH is present in the waters and submerged lands off Wake Island's shore. Designated EFH supporting the MUS and life stages found in these waters include eggs, larvae, juveniles, and adults of bottom fish MUS; eggs, larvae, juveniles, and adults of crustacean MUS; and eggs, larvae, juveniles, and adults of pelagic MUS. EFH habitats include coral reef, patch reef, hard substrate, soft substrate, artificial substrate, seagrass beds, mangrove, lagoon, estuarine, surge zone, deep-slope terraces, and pelagic/open ocean.

Threatened and Endangered Species

Three ESA-listed terrestrial species may be present on Wake Atoll: the endangered band-rumped storm petrel (*Oceanodroma castro*), endangered Hawaiian petrel (*Pterodroma sandwichensis*), and endangered short-tailed albatross (*Phoebastria [=Diomedea] albatrus;* USFWS 2023c). These species are also protected under the MBTA. Although these species may be encountered, their occurrence has not been documented at Wake Atoll (Gilardi 2022, 2023; USDA 2022).

ESA-listed marine species that may occur in the lagoon and open ocean surrounding Wake Atoll include the endangered hawksbill sea turtle (*Eretmochelys imbricata*), which was sighted in waters around Wake Atoll in 2020; endangered green sea turtle (*Chelonia mydas*; Central West Pacific Distinct Population Segment); and three threatened coral species (*Acropora speciosa, Acropora retusa, and Acropora globiceps*), two of which (*A. retusa and A. globiceps*) are confirmed to be present in multiple locations along the southern portion of the atoll (USFWS 2017b, as cited in USAF 2023d). The endangered leatherback sea turtle (*Dermochelys coriacea*) and threatened scalloped hammerhead shark (*Sphyrna lewini*) may also occur in ocean waters around Wake Atoll. The occurrence of leatherback sea turtles has not been documented at Wake Atoll. A single scalloped hammerhead shark was observed in the water surrounding WIA. This is the only recording of this species to date, and it may have been a transient individual, rather than part of a permanent population (Brown 2021, as cited in USAF 2023d). The humphead wrasse (*Cheilinus undulatus*) and the bumphead parrotfish (*Bolbometopon muricatm*) occur in waters surrounding Wake Atoll, and while not federally listed, are considered Species of Concern by NOAA-NMFS (USAF 2023d).

All areas on WIA have been precluded from designation as critical habitat due to the conservation measures included in the 2023 WIA INRMP (USAF 2023d) and USAF 611 CES management actions, which conserve habitat and provide benefits to listed species.

Migratory Birds

Table 3.7-4 lists bird species observed in the project ROI during a survey of biological resources between 9 to 24 March 2023, all of which are protected under the MBTA (USFWS 2023b). Active nests or depressions (in the case of non-nesting species) were present at nearly every location where birds were observed.

Table 3.7-4 Protected Bird Species Observed During Biological Resources Survey (March 2023)

COMMON NAME	SCIENTIFIC NAME	BREEDING SEASON	DESCRIPTION	LOCATION(S) IN RELATION TO ROI
Black noddy	*Anous minutus*	Year-round	The black noddy has sooty black plumage with a white cap that blends into the dark neck, a white crescent on the lower eyelid, and black legs and feet. It nests on ledges and in crevices of coastal cliffs, in sea caves, and in ironwood trees. Black noddies were estimated to have 2,000 nests in ironwood trees around Wake Atoll in 2007. During monitoring surveys in 2010 and 2011, black noddies were surveyed on Wake Island in 10 separate monitoring plots. In October 2010, a total of 177 adult birds and 13 active nests were observed. In February 2011, a total of seven adult birds and one active nest were observed. These data indicate that relatively few black noddy nests are initiated during the winter. Black noddies have consistently nested in casuarina trees on Wake Atoll; from 2014–2021, nest counts for each year have consistently been above 100 except 2020, when 65 nests were counted. During monitoring surveys conducted between 26 February – 9 March 2023, 139 nests and 209 adults were observed in 10 study plots on Wake Island, exclusively in casuarina trees.	All project siting locations including Downtown
Laysan albatross	*Phoebastria immutabilis*	Late November – early December	The Laysan albatross is a small albatross that is mostly white. Its back, upper wings and tail are dark brown, and it has a dark patch around the eye. Its feet extend beyond its tail in flight. It is a bird of the open ocean and is rarely seen near land except on breeding islands. The Laysan albatross is known to have nested on Wake Atoll in the past few years. It nests on open ground, preferably close to taller vegetation. The nest is a shallow depression in the ground surrounded by a built-up rim. The incubation period lasts 63 to 66 days. Traditional nesting areas include the northern end of the eastern side of the runway and the MDA area near Peacock Point. Surveys from 2010—2021 detected variable but increasing numbers of adults, from 7 in 2010 to 24 in 2020. During monitoring surveys conducted between 26 February – 9 March 2023, Laysan albatross was consistently observed at the former golf course.	Outside ROI near proposed parking apron at Pond 6 (Figure 3.4-1)
Northern pintail	*Anas acuta*	Spring/summer*	The northern pintail is a slender, long-necked duck with a long tail. It has a brown speculum with a trailing white edge. The male is gray with a brown head and white breast, a long, pointed tail, and a white line up the side of the neck. The female is mottled brown and has a shorter tail than the male. It nests on dry ground among short vegetation, usually near water. The nest (built by the female) is a shallow depression lined with grasses, twigs, leaves, and an addition of down. The northern pintail usually occurs in low numbers on Wake Island. In October 2007, a flock of 26 northern pintails were observed. During monitoring surveys conducted in October and November 2010, northern pintails were observed on every visit to the wetlands, with a total of 30 females recorded. One female was observed in wetlands adjacent to the airfield and POL storage area during site visits conducted in October 2013. During monitoring surveys conducted between 2 – 16 December 2022, northern pintails were observed at the ponds adjacent to the proposed parking apron (Figure 3.4-1).	Proposed parking apron in ironwood stand at Pond 5 (Figure 3.4-1)

Table 3.7-4 Protected Bird Species Observed During Biological Resources Survey (March 2023)

COMMON NAME	SCIENTIFIC NAME	BREEDING SEASON	DESCRIPTION	LOCATION(S) IN RELATION TO ROI
Pacific golden-plover	*Pluvialis fulva*	Spring/summer*	The Pacific golden-plover is a common migrant in much of the Pacific and is the most numerous shorebird observed at Wake Atoll. It has dark brown upperparts speckled with gold to pale yellow or white. A white stripe extends from the forehead, over the eyes, to the wings. Breeding males are solid black from the chin to under the tail. Females are duller in color. The Pacific golden-plover nests in arctic and subarctic tundra, both in lowlands and mountains. In the fall, it migrates from Alaska to islands in the Pacific and often on to Australia for the winter, regularly covering over 2,000 miles in a single nonstop flight. It does not breed on Wake Atoll. Pacific golden-plovers are common throughout open areas on Wake Atoll, including the former golf course, runway, and reef flats. During monitoring surveys in 2010 and 2011, the Pacific golden-plover was the most common species observed in the wetlands and in the exposed mudflats. A total of 94 individuals were recorded in wetland areas and 262 individuals were recorded in mudflats. A total of 270 Pacific golden-plovers were recorded during the surveys conducted between 15 November 2011 and 26 July 2012. Pacific golden-plovers were also commonly observed during site visits conducted in October 2013, primarily in mowed habitats. During monitoring surveys conducted between 26 February – 9 March 2023, they were observed throughout the atoll in mowed fields, at pond edges, and in the intertidal zone. On 7 March 2023, 196 Pacific golden-plovers were observed at Wake Island.	Proposed parking apron in ironwood stand at Pond 5 (Figure 3.4-1); proposed CSF and Base Living Quarters; outside ROI near proposed Base Ops Facility at Pond 7 (Figure 3.4-1)
Red-tailed tropicbird	*Phaethon rubricauda*	Year-round (most active between February and June)	The red-tailed tropicbird is a is a showy, white seabird related to boobies and frigatebirds. It is white with stiff, bright red central tailfeathers, a bright red down-curving bill, black legs and feet, black streaks on the sides of its body and base of its wings, and a distinctive black eye stripe. It nests in crevices or holes in rock, on ledges, on the ground under dense vegetation, and sometimes in hollow trees or logs. Red-tailed tropicbirds regularly nest around the airfield and in casuarina trees on Wake Island; because of BASH concerns they are frequently hazed away from the airfield, and approximately 75% of suitable habitat has been removed during casuarina control projects. Red-tailed tropicbirds lay a single egg in a depression on the ground beneath several species of shrubs or trees. Both the ironwood removal project and the BASH Program have greatly reduced suitable nesting habitat in traditional nesting areas. Many nest locations have moved into dense vegetation such as pemphis. It is estimated that 100 red-tailed tropicbirds were present on the atoll during a 2007 survey, largely on Wake Island. In January and February 2011, six active nests on Wake Island were observed. In October 2013, red-tailed tropicbirds were regularly observed flying over Wake Island. Two active nests were observed along Wilkes Avenue between the gate to the Wilkes Island bird nesting area and the submarine channel, and one was observed along the shore near the Prisoner of War Memorial at the southwestern corner of Wake Island. During monitoring surveys conducted between 26 February – 9 March 2023, 136 active red-tailed tropicbird nests were discovered on Wake Island, 99 of which were in the incubation phase.	Proposed parking apron in ironwood stand and at Pond 5 (Figure 3.4-1) and proposed Base Ops Facility in vicinity of B106; outside ROI at Ponds 3, 4, 6, and 7 (Figure 3.4-1); appeared to be resting and/or nesting at all locations observed

Table 3.7-4 Protected Bird Species Observed During Biological Resources Survey (March 2023)

COMMON NAME	SCIENTIFIC NAME	BREEDING SEASON	DESCRIPTION	LOCATION(S) IN RELATION TO ROI
Ruddy turnstone	*Arenaria interpres*	Spring/summer*	The ruddy turnstone is a shorebird with short orange legs and a thick pointed bill. It has a distinctive black or gray and white pattern on its head and breast. Its back is reddish-brown and its tail is white with a black terminal band. It has a highly distinctive black and white pattern on its wings and tail in flight. The ruddy turnstone breeds along rocky coasts and in the tundra across the High Arctic. In North America it breeds in sparsely vegetated tundra near marshes, streams, and ponds. It does not breed on Wake Atoll, but it occurs on Wake Island in low numbers. However, during monitoring surveys in 2010 and 2011, ruddy turnstones were observed on almost all visits to the wetlands (47 individuals) and mudflats (54 individuals). A total of 31 ruddy turnstones were observed during six survey events associated with USFWS Wake Atoll Rat Eradication Shorebird Surveys in 2011 and 2012. In October 2013, several individuals and small flocks of ruddy turnstone were observed in different locations, primarily in association with mowed habitat. During monitoring surveys conducted between 26 February – 9 March 2023, five ruddy turnstones were observed in fields adjacent to the runway.	Proposed parking apron near Pond 3 (Figure 3.4-1)
White tern	*Gygis alba*	Year-round (most active between February and June)	The white tern is a small white seabird with slate-colored legs and feet, a black eye ring, a shallowly forked tail, and a heavy bill shaped like an elongated triangle that is mostly black with blue at the base. White terns do not build nests; they lay their eggs on small depressions on tree branches, buildings, or other manufactured structures, rock ledges, or on the ground. White terns primarily nest on ironwood branches on Wake, Wilkes, and Peale Islands. In 2007, an estimated 500 white terns nested in ironwood on the atoll. In October 2010, a total of 16 adult birds, 1 active nest, and 2 juveniles were observed. In February 2011, a total of 16 adult birds and 1 large chick were observed. The low number of nests recorded indicates that surveys were completed outside the peak nesting season. White terns have been consistently surveyed from 2014–2021, with a gradual increase in nests over this period, from 4 in July 2014 to 17 in March 2021. During monitoring surveys conducted between 26 February – 9 March 2023, 12 active nests and 57 adults were counted in 10 study plots on Wake Island.	All project siting locations including Downtown

Notes:

For definitions, refer to the Acronyms and Abbreviations section.

Source: USAF 2023d; Gilardi 2022, 2023; Audubon 2023a, 2023b; Hawaiʻi Department of Land and Natural Resources (HI DLNR) 2015a, 2015b; All About Birds 2023, Cornell University 2023.

* Indicates the species is migratory and does not breed on Wake Atoll

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Wake Atoll National Wildlife Refuge is a unit of the National Wildlife Refuge System encompassing 495,515 acres of submerged lands and waters surrounding Wake Atoll from the mean low water line of the islands out to 12 nautical miles (USFWS 2023d). Per Secretary of the Interior Order No. 3284, Amendment No. 1, these submerged lands and waters are managed by the Director of the Secretary of the Interior, whereas the emergent lands at Wake Island are managed by the Department of the Air Force in accordance with the terms and conditions of 1972 Agreement between the Secretary of the Air Force and the Secretary of the Interior (DOI 2016).

3.7.2.2 Natural Resources

Timber

Wake Island's low elevation and frequent tropical storms make the island susceptible to damage from high winds, rogue waves, and extensive flooding (USAF 2023d). Consequently, there is very little natural vegetation on the atoll, including timber resources. The predominant tree species on the island is ironwood, native to Australia and first documented on the island in 1959. Events such as "family tree planting days" occurred throughout the 1960s and 1970s, during which the Boy Scouts and island residents planted ironwood trees for their ability to endure the harsh weather and climate conditions (PRSC 2021a). The species is invasive and is crowding out other vegetation, creating flight operations hazards near the runway (PRSC 2022) and increasing the risk of wildland fires (USAF 2023d). The trees provide habitat for migratory birds and invasive rat species populations and offer no other benefit to the natural environment.

A stand of ironwoods is within the 3,000-foot Clear Zone adjacent to Taxiway Alpha and Parking Apron Alpha. The encroachment of woody vegetation presents potential flight operations hazards and does not align with standards mandated by AFI 32-1015 (PRSC 2022). The federal wildland fire policy requires that federal lands have a management policy to safely mitigate losses from wildland fires. The Base Operations Support (BOS) contractor is responsible for assessing and removing excess vegetation from the forest floor to reduce the fuel load and the risk of wildland fires. The BOS contractor is also required to train and maintain certified staff able to respond to wildland fires on the island (USAF 2023d). Management is ongoing through the removal of ironwoods or the application of herbicidal treatments (PRSC 2022).

Gravel/Topsoil/Unclassified Material

Soil formation on WIA is minimal as a result of high winds, high waves, and localized inundation of the atoll (USAF 2023d). Drought-like conditions and a lack of soil, soil nutrients, and organic matter provide few resources for topsoil extraction. Gravel is a mixture of coral, coral cobble, shells, sand, and limestone, which lacks the nutrients necessary to support most plant species (MDA 2015). The ESA prohibits the taking of any threatened or endangered species, dead or alive, or products derived from those protected species. Because the atoll provides critical habitat for two ESA coral species, dead coral intermixed with the island's overall gravel composition is forbidden from natural resource extraction or use.

Coastal Zone Management

The atoll is surrounded by the 200-mile U.S. Fishery Conservation Zone (USAF 2023d). These waters were included in the PRIMNM when it was established in 2009 to prohibit commercial fishing and manage fishery-related activities. The PRIMNM was expanded in 2014 as a biodiversity safe haven for Central Pacific ecosystems (USFWS 2023e) and their natural resources such as Wake Atoll's coral reefs, migratory and sea/shorebirds, various fish populations, and other aquatic life.

The Coastal Zone Management Act (CZMA) was enacted in 1972 to "establish a national policy and develop a national program for the management, beneficial use, protection, and development of the land and water resources of the nation's coastal zones" (CRS 2019). This policy provides a framework for states and territories to develop their own coastal management programs. Although Wake Island falls into federal conservation zones and marine monument areas with recreational guidelines, WIA and its surrounding resources are not subject to CZMA program practices (PRSC 2022); USAF is responsible for managing coastal resources. No state or territory coastal management programs have been established for Wake Island (EPA 2021).

Solar Resources

Wake Island's climate is equatorial tropical (PRSC 2021a) and receives consistent sun exposure; over 13 hours per day during the summer (Cedar Lake Ventures, Inc. 2023). A photovoltaic solar power array located north of the industrial area harnesses the sun's energy to complement the electricity produced by the island's power plant, located Downtown. The array currently does not have a working battery bank to store energy generated by the solar panels and only provides power during the day. Until it can be repaired, solar energy production meets approximately 10% of the island's electricity demand (USAF 2024d).

Coal

There are no naturally occurring fossil fuel resources, including coal, on the atoll.

Petroleum

There are no naturally occurring fossil fuel resources, including petroleum, on the atoll. Some operations require fossil fuel consumption necessitating the presence of bulk fuels stored onsite. A tank farm and associated infrastructure are located on Wilkes Island west of the airfield. Fuels infrastructure is under the control of the Defense Logistics Agency, which sends transient personnel to the island to resupply fuel for construction and maintenance projects (PRSC 2021a).

USAF has reduced fuel consumption and emissions by introducing electric and diesel vehicles to their fleet (USAF 2023d); however, aircraft, machinery, maintenance equipment, and other operations still require petroleum products that contribute to resource depletion.

Training and Recreational Spaces

There are no areas for training or mission exercises on the atoll, and recreation for personnel on the island is limited to activities such as bicycling, tennis, basketball, kayaking, fishing, and snorkeling (USAF 2023d). Personnel must bring their own snorkel gear, and some kayaks are no longer fit for aquatic use. Many of the facilities identified for recreation and morale are no longer functional or are in need of rehabilitation (PRSC 2021a). Land formerly used as a golf course is positioned between Downtown and the industrial area. There are remnants of greens and holes, and frisbee golf holes, which are no longer used or infrequently used for recreation. The roads are sometimes used as running paths but are uneven and unlit; and vehicle traffic can be a safety hazard for runners (PRSC 2021a).

Security requirements and the atoll's remote location preclude public access to the island. Recreational programs offered to mission-related personnel on the island are the responsibility of the BOS contractor with support and oversight by both Det 1 and 611 CES/CEIE Natural Resources Program Manager (USAF 2023d). The waters surrounding the atoll lie within the Wake Atoll National Wildlife Refuge and

Wilkes Island is a sanctuary and nesting area for migratory birds. All three islands comprising the atoll contain features of historical significance from the WWII, Cold War, and trans-Pacific travel eras.

3.7.3 Environmental Consequences

3.7.3.1 Proposed Action

Biological Resources

Vegetation

Approximately 5.45 acres of vegetation, primarily composed of invasive ironwood stands, would be removed under the Proposed Action, resulting in long-term, direct beneficial and adverse impacts on vegetation. By removing ironwood, an invasive species that competes against native vegetation for resources (a species already planned for removal under a separate USAF action), the Proposed Action would have moderate beneficial impacts on vegetation on the atoll. However, it would have minor adverse impacts on small native plant communities in the ROI, predominantly composed of pemphis and tournefortia thickets. USAF policies and guidelines regarding grounds maintenance and urban forest management are included in Chapter 12 of AFI 32-7064 (USAF 2014). This document encourages the use of regionally native plants to the maximum extent possible in landscaped designs, minimizing landscape maintenance, minimizing the need for irrigation, and naturalizing landscaped areas as much as possible.

Wildlife

The Proposed Action would have short- and long-term, moderate, direct adverse impacts on wildlife species in the ROI caused by increased noise levels and human activity during construction, which could startle and temporarily displace wildlife. The vegetation removal noted above would cause permanent displacement of wildlife. In such instances, it is expected that wildlife would use adjacent habitat. When compared to the entire acreage of vegetation on the atoll (approximately 1,282 acres, not including invasive ironwood), the impacted forest represents a negligible amount of habitat loss. During the biological resources survey conducted in March 2023, the strawberry hermit crab was observed most frequently in stands of ironwood trees. Personnel from the 611 CES Natural Resources team would search for crabs prior to and during ironwood removal operations and would physically remove all crabs encountered during project implementation (PRSC 2022). Pacific rats were observed in ironwood forests, where they appeared to be burrowing into the mat of decayed plant matter comprising the forest floor. This species is not native to the island and poses a threat to human health, infrastructure, and natural resources on Wake Island. USAF is preparing to eradicate the Pacific rat from Wake Atoll in a separate action (PRSC 2021b). Removing ironwood stands may facilitate this objective by forcing the species into the open and reducing the ironwood removal project's area of impact.

The 611 CES Natural Resources Program Manager would provide limited support for actions that may disturb wildlife and plants, including implementation of BMPs (PRSC 2022).

Protected and Sensitive Species

Because the Wake Atoll National Wildlife Refuge does not include emergent lands at Wake Island, a USFWS Special Use permit is not required for implementing the Proposed Action. USAF would consult with USFWS and/or NOAA-NMFS as appropriate regarding effects to species in the submerged lands and waters surrounding the atoll.

Marine Mammals

The Proposed Action would have negligible to no impact on marine mammals. The primary threats to marine mammals in the vicinity of Wake Atoll are vessel strikes, entanglement in fishing gear, and ocean noise. Other threats include climate change, marine debris, and environmental contaminants. Barge traffic is not expected to increase during implementation of the Proposed Action; however, if increased vessel traffic were necessary for project implementation, the likelihood of an individual cetacean being struck during the towing vessel and barge transiting to/from Wake Island Airfield is extremely unlikely, and therefore discountable (Appendix A). Estimated construction noise levels are less than the non-impulsive acoustic thresholds for cetaceans (NMFS 2023) and would not adversely affect whale or dolphin species. Debris generated by the Proposed Action would be managed and disposed of in accordance with the WIA Solid Waste Management Action Plan. BMPs such as watering unpaved roads to prevent dust agitation and maintaining vegetated buffers between project areas and open water would be required for dust control and offsite migration of sediments or contaminants.

Essential Fish Habitat

The Proposed Action may have direct and indirect, short-term, minor adverse impacts on EFH. Potential effects to EFH from the Proposed Action include:

- Exposure to increased barge traffic
- Exposure to suspended sediment
- Exposure to contaminant runoff
- Exposure to demolition and construction noise

Barge traffic is not expected to increase during implementation of the Proposed Action; however, if increased vessel traffic were necessary for project implementation, it would not adversely affect EFH because the size, number, and duration of the vessels' anchorage would not change. BMPs such as watering unpaved roads to prevent dust agitation and maintaining vegetated buffers between project areas and open water would be required for dust control and offsite migration of sediments or contaminants. Estimated construction noise levels are below the non-impulsive acoustic thresholds for fishes and would not adversely affect fish species. The full report evaluating the potential effects to EFH is provided in Appendix D.

Based on the impact analysis and with implementation of the proposed BMPs, the 611 CES determined that the Proposed Action would not adversely affect the quality of EFH. The 611 CES initiated EFH consultation with NOAA-NMFS on 27 March 2024. On 26 April 2024, NOAA-NMFS provided the following conservation recommendations to avoid, minimize, offset, or otherwise mitigate adverse effects to EFH:

1. Install, monitor, and maintain appropriate silt containment devices to ensure their continued effectiveness.
2. When possible, stop work during heavy rains.
3. Inspect all equipment prior to beginning work each day to ensure the equipment is in good working condition and not leaking. Leaking equipment must not be used until leaks are repaired and equipment is cleaned. Equipment should always be stored in an appropriate staging area designed to be preventative in terms of containing unexpected spills when equipment is not in use or during fueling.
4. Fuel project-related vehicles and equipment at least 50 feet, or the maximum distance possible, from the water and within a containment area, preferably over an impervious surface.

5. Ensure that USAF's proposed BMPs and NOAA-NMFS' conservation recommendations are effectively implemented during project activities.

The 611 CES provided written acknowledgement agreeing to implement the conservation recommendations on 14 May 2024. Documentation of correspondence with NOAA-NMFS is provided in Appendix A.

For these reasons, the Proposed Action would not have a significant adverse impact on the quality of EFH.

Threatened and Endangered Species

The Proposed Action would have no impact on ESA-listed terrestrial species. Federally protected terrestrial biota on Wake Atoll is limited to migratory birds. Three of these species are protected under the ESA, though none have been documented at WIA during quarterly bird surveys and surveys performed during site visits under the BASH Program (USAF 2023d; USDA 2022; Gilardi 2022, 2023) and none were observed during the biological resources survey conducted in March 2023. USAF has determined that there would be no effect on these species under Section 7 of the ESA; therefore, consultation with USFWS is not required.

The Proposed Action may have direct and indirect, short-term, minor adverse impacts on ESA-listed aquatic species (hawksbill sea turtle, green sea turtle, *A. speciosa* coral, *A. retusa* coral, and *A.a globiceps* coral) resulting from exposure to increased barge traffic, suspended sediment, contaminant runoff, unmitigated exterior lighting, and construction noise. Conservation measures consistent with the 2023 INRMP (USAF 2023d) would be implemented to minimize potential impacts to federally listed species. These include:

- Maintain a minimum of 100 feet vegetative buffers between project areas and open water.
- Employ LID strategies as prescribed by UFC 3-210-10.
- Place silt fencing around project footprints, staging areas, and near the shoreline to minimize runoff of contaminants and particulate matter into the marine environment.
- Adhere to Appendix O (Standards for Exterior Lighting at Wake Island Atoll) of the 2023 IRMP (USAF 2023d). Incorporate wildlife-friendly lighting and shielding into the project design as mission and safety allow.
- Incorporate wildlife-friendly lighting and shielding into project designs for new construction or light replacement as mission and safety allow.
- Conduct biological monitoring for the duration of the project.
- Cease all project work if any federally listed threatened or endangered species are present within 100 feet of the action. Document the incident, notify 611 CES Natural Resources, and wait for the listed species to leave the area on its own, or await further instruction from USFWS/NMFS.
- Strategically install core logs, absorbent socks, silt curtain, or similar items to capture overland stormflow that may transport sediments in areas that are within 50 feet of open water until the roads have been compacted.

The full report evaluating the potential effects on federally listed species is provided in Appendix D.

Based on the impact analysis and with implementation of the proposed avoidance and minimization measures, the 611 CES determined that the Proposed Action may affect but is not likely to adversely affect (NLAA) listed species. The 611 CES initiated ESA Section 7 consultation with NOAA-NMFS on 27 March

2024. NOAA-NMFS concurred with the NLAA determination on 9 May 2024. Documentation of correspondence with NOAA-NMFS is provided in Appendix A.

Migratory Birds

Seven migratory bird species were observed in the ROI during the biological resources survey conducted in March 2023. The species most frequently noted were black noddy, white tern, and red-tailed tropicbird. Black noddys and white terns seemed to prefer the cover of ironwoods, while red-tailed tropicbirds were frequently observed resting/nesting on the ground under pemphis shrubs.

Plumes of smoke created by controlled burns or burning felled ironwoods would have short-term, moderate, direct adverse impacts on migratory birds. During construction activities, off-road transport of heavy machinery such as excavators, chippers, bulldozers, and chainsaws; removal of nesting and roosting habitat; and disruption/displacement of breeding seabirds, eggs, and chicks would have short-term, substantial, direct adverse impacts on birds. The proposed vegetated area to be removed represents a negligible amount of habitat loss when compared to the total acreage of vegetation on the atoll (approximately 1,282 acres, not including invasive ironwood). Adverse impacts on affected birds would be minimized by encouraging them to exit areas of vegetation clearing before commencing removal activities each day, though it is anticipated that birds would vacate the vicinity due to the noise of heavy machinery. To minimize impacts, burning would occur within the boundaries of the existing solid waste accumulation area. A habitat management plan would be included as part of the work plan and scope to ensure that the area is managed in a way that does not attract other avian species, which could increase BASH hazards.

The Proposed Action would result in long-term, minor, direct beneficial impacts on migratory birds by promoting nesting away from airfield activities and removing habitat for invasive Pacific rats that are known to prey upon seabird eggs and chicks.

It is anticipated that vegetation removal would necessitate temporary possession of adults, active nests, and nest contents; nest removal; and trapping/relocation, especially if an adult or nest-dependent bird of any species were to become critically injured or abandoned due to project activities. These actions constitute “take” and would require authorization granted by a MBTA Special Purpose Permit under 50 CFR 21.27 in consultation with USFWS. The MBTA permit authorization may also include specialized permissions for humane euthanasia of injured or orphaned birds, if deemed necessary and appropriate by USFWS, and in association with implementation of specific bird management activities, BMPs, conservation measures, and other permit conditions. The project work plan would reflect the conclusions of the USFWS consultation and would provide the MBTA permit conditions and other BMPs that would be implemented within the ROI. Documentation of correspondence with USFWS is provided in Appendix A.

Natural Resources

Timber

The Proposed Action would have no impact on the atoll’s timber resources because none are available on the island. Timber resources designated for commercial use would be outsourced and arrive on the island via barge or cargo aircraft. The demand for commercial timber required for construction would have direct, long-term, minor, adverse impacts on timber resources in general. The most appropriate removal and disposal methods would be employed based on feasible options and conditions at the time of clearing. Disposal methods may include wood chipping, controlled wood pile burning, and in-situ controlled burning. USAF would evaluate an increased demand against the available timber supply, if necessary, and modify the use or consumption of this natural resource according to the installation's INRMP.

Gravel/Topsoil/Unclassified Material

The Proposed Action would have short-term, minor, direct adverse impacts on gravel, soil, and other fill materials resulting from ground disturbance, excavation, stockpiling, and grading. The impacts would be negligible, as very few of these resources are available on the island, and the coral substrate of the island precludes extraction or use of this resource under the ESA. Erosion control measures would minimize ground-disturbing impacts during construction. Any soil or fill material brought to the island for construction would be subject to the WIA Biosecurity Management Plan (PRSC 2015 or most recent update) or applicable USDA regulatory guidelines to mitigate against importing species and agricultural goods that may be inhospitable to the island.

Coastal Zone Management

The Proposed Action would have no impact on coastal zone management. Discharges approved under Wake Island's existing NPDES permit would remain the same or be evaluated for modifications, if necessary, when the permit is eligible for renewal. USAF would still be responsible for managing the atoll's coastal resources, and protective management practices would govern the marine environment as a unit of the National Wildlife Refuge System and the PRIMNM.

Solar Resources

The Proposed Action would have no impact on solar resources. The site's remote location in the South Pacific ensures regular exposure to solar resources required to generate electricity at the 750-kW solar array (PRSC 2021a). The array was not functioning when the IDP was prepared in 2021 or during 2023 site surveys supporting this evaluation; however, the system was working for at least 6 months in 2020 as evidenced by the output data confirming daily peak production (PRSC 2021a). Operations would continue as they have without additional demand for solar resources, because they are plentiful and would presumably be available when necessary for the array to function at full capacity. Should electricity consumption or demand exceed the supply currently generated by the Wake Island power plant, the increase in demand would be evaluated in a separate NEPA analysis.

Coal

The Proposed Action would have no impact on coal resources. Coal is not used as a heating source or to generate electricity on the island. Coal would not be required to complete improvements to existing infrastructure or construct the new airfield, Base Ops Facility, CSF, or Base Living Quarters.

Petroleum

The Proposed Action would have long-term, minor, direct adverse impacts on petroleum resources. Additional petroleum resources would be required to operate machinery, fuel equipment, and vehicles necessary for construction and demolition, and support post-construction operations. No additional jet fuel storage is expected, because there would be no change in the number of aircraft permanently stationed at the airfield.

Training and Recreational Spaces

The Proposed Action would have no impact on recreational activities such as bicycling, kayaking, diving, fishing, and snorkeling. The former golf course is no longer used for recreation; therefore, repurposing the land to construct the CSF and Base Living Quarters would offer new community and recreational facilities such as a DFAC, fitness center, and billeting, among other services. These facilities would be available to personnel living on the atoll and would have no impact on mission-related training or operational spaces.

3.7.3.2 No Action Alternative

Biological Resources

Under the No Action Alternative, none of the proposed projects would be implemented. Vegetation removal for facility and infrastructure projects would not occur and wildlife would not be displaced. This would result in long-term, minor, direct beneficial impacts on small native plant communities targeted for removal under the Proposed Action; however, any ironwood trees identified for pre-construction removal would continue to grow and overtake native vegetation, resulting in long-term, moderate, direct adverse impacts on native vegetation. There would be no impact on wildlife, including federally protected species. The Pacific rat would continue to seek refuge in ironwood forests and pose a threat to human health, infrastructure, and natural resources on Wake Island.

It is presumed that construction would occur in both developed undeveloped areas on the installation in accordance with the IDP (PRSC 2021a) and ADP (Jacobs 2021a). Changes in aircraft numbers and existing aircraft operations are not anticipated. Changes to the baseline noise environment from staging and construction would be temporary and would have short-term, minor to moderate, direct adverse impacts on wildlife. There would be no impact on federally listed threatened or endangered terrestrial species or critical habitat, because none are present on Wake Island. If impacts on federally protected aquatic species were anticipated, or if vegetation removal from suitable nesting habitat were proposed, USAF would initiate consultation with USFWS and/or NOAA-NMFS as appropriate to determine the level of impact and develop project- and/or species-specific BMPs and conservation measures to minimize adverse impacts. For these reasons, significant impacts on biological resources from implementing the No Action Alternative are not anticipated.

Natural Resources

Under the No Action Alternative, none of the proposed facility and infrastructure projects would be implemented. No fossil fuel extraction or timber harvests off-island would be required for construction. No additional water would be required to produce potable water, and no solar resources would be necessary for supplemental electricity generation. Fossil fuels used for electricity generation and bulk fuel storage on the island would remain unchanged.

There would be long-term, minor, direct adverse impacts resulting from unchecked invasive ironwood population growth under the No Action Alternative. Any ironwood trees identified for pre-construction removal would continue to grow and overtake native vegetation. The trees would not be cleared to lower wildland fire risks (USAF 2023d), for expeditionary housing construction, or to remove vegetation encroaching into the Clear Zone (Jacobs 2021a), thereby limiting USAF's ability to meet mission objectives. There would be no impact on gravel, topsoil, and unclassified material, which would not be disturbed, removed, or used as a project material source under the No Action Alternative. There would be no impact on coastal zones or training and recreational spaces, as the coastal zone would remain unchanged and there would be no alterations to training and recreational spaces.

3.7.4 Cumulative Impacts

3.7.4.1 Biological Resources

The majority of the RFFAs listed in Table 3.1-2 are demolition, repair, and replacement projects, which would have short-term, negligible to minor, cumulative adverse impacts on wildlife, primarily from noise generated by construction equipment. If impacts on federally protected wildlife species were anticipated, such as from habitat removal or in-water work, USAF would initiate consultation with USFWS and/or NOAA-NMFS as appropriate to determine the level of impact and develop project- and/or species-specific BMPs and conservation measures to minimize adverse impacts. When the effects from RFFAs are considered cumulatively, long-term, substantial reductions in species populations would not be expected, given that development would primarily occur in areas that have already been disturbed and where wildlife habitat is marginal.

Short- to long-term, minor, cumulative adverse impacts on vegetation would occur from project construction and vegetation clearing. Impacted grass areas around the installation are maintained in accordance with the WIA INRMP (USAF 2023d). Vegetation clearing would represent a minor amount of vegetation loss when compared to the entire unimproved areas on the installation. For these reasons, significant cumulative impacts on biological resources are not anticipated.

3.7.4.2 Natural Resources

There are very few naturally occurring resources on the island, and none of them would be necessary for this project. Many of the natural resources necessary for the Proposed Action or RFFAs would arrive at the island via barge. All shipments, including construction materials and equipment, carry a high biosecurity risk and all actions associated with the Proposed Action or RFFAs would be required to follow WIA's Biosecurity Management Plan (PRSC 2015 or most recent update).

Ironwood trees would be removed to relocate and construct the Base Ops Facility, relocate memorials, construct the CSF and Base Living Quarters, and expand the parking apron. A separate ironwood tree removal project is planned at Wake Island. This project will remove up to 70 acres of ironwood trees south of the runway near the HCPs and in the vicinity of the proposed apron expansion, depending on budget and schedule (PRSC 2022; USAF 2024b). It is possible that tree clearing for the Proposed Action could overlap this RFFA. Cumulative impacts from these projects would be temporary, moderate, and adverse during the initial removal; however, they would be significant and beneficial to WIA in the long term. Ironwood removal would help to eradicate an invasive species, allowing WIA to return to its natural state (PRSC 2022); it would clear land for necessary housing and support facilities; and it would improve safety in the Clear Zones.

Gravel and soil resources would experience long-term, minor to moderate, cumulative adverse impacts from the construction and demolition of various structures and facilities as well as the ongoing removal of ironwood trees. Erosion control measures would help maintain ground stability and minimize erosion of accretion resulting from high winds and high waves known to occur around the island. There would be no cumulative impacts on coastal zone resources or management practices. No new solar arrays are planned and additional solar energy to power future projects is not anticipated. No cumulative impacts on coal resources are anticipated.

The increased construction and equipment necessary for the Proposed Action as well as RFFAs would result in long-term, moderate to substantial, cumulative adverse impacts on petroleum resources necessary to support operations at WIA. The ironwood tree removal would require multiple pieces of petroleum-fueled equipment such as chainsaws, loaders, and backhoes. The new bulk fuel storage tanks would have similar equipment requirements (Jacobs 2021a). If herbicides, in addition to machinery, were necessary to remove ironwoods, mitigation measures would be necessary to prevent herbicides from migrating into the stormwater system. Implementation of the potential projects would increase the cumulative adverse impacts on petroleum resources on the island in both the short- and long-term. Training and recreational spaces would experience long-term, negligible to minor, cumulative adverse impacts because there are no formal training or recreational areas. One RFFA is construction of a running trail, which would have long-term, substantial, beneficial cumulative impacts to training and recreational spaces, as there is currently no running trail and runners are forced to use roads.

3.8 Cultural Resources

3.8.1 Definition of Resource

The term "cultural resources" refers to tangible remains and material evidence resulting from past human activity and/or specific locations of traditional importance. Cultural resources include prehistoric and historic archaeological sites, structures, buildings, districts, landscapes, or other locations or objects determined important for scientific, traditional, religious, or societal reasons. This includes Native American, Native Hawaiian, and Alaska Native sacred sites and Traditional Cultural Properties.

Potential cultural resource impacts are addressed by Section 106 of the NHPA (54 USC 300101 *et seq*.), which requires federal agencies to consider effects to "historic properties" from an undertaking. Historic properties are defined (54 USC 300308) as cultural resources that are either listed, or eligible for listing, in the NRHP. The cultural resources discussed in this section include those that meet the specific criteria of the NHPA and associated regulations. The Section 106 process is set forth in 36 CFR 800 "Protection of Historic Properties." Per AFI 32-7065 and 36 CFR 800.8, the 611 CES coordinates NEPA compliance with its NHPA responsibilities to ensure that historic properties and cultural resources are given adequate consideration during project planning. This analysis incorporates Section 106 review into the NEPA process.

3.8.2 Affected Environment

As defined under 36 CFR 800.16(d), the Area of Potential Effect (APE) is the geographic area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. The APE is determined by the scale and nature of the undertaking and may be different for different kinds of effects caused by project activities. For the purposes of this analysis, the term APE is synonymous with ROI.

USAF has defined the APE for this undertaking as the specific area of disturbance on Wake Island associated with proposed facility construction and demolition, as shown on Figures 2.1-1A, 2.1-1B, 2.1-1C, and 2.1-1D.

3.8.2.1 Archaeological Resources

Wake Atoll, known in Marshallese as *Eneen-Kio* or *Ane-en-Kio*, "Island of the Orange Flower," has no unequivocal archaeological evidence of prehistoric Polynesian settlements. However, Marshallese oral tradition states the atoll was visited periodically by prehistoric Pacific Island/Marshallese voyagers who sought seabird plumage, a unique orange flower called a *Ane-en-Kio,* which was found only on the atoll, and large bird wingbones that could be used for tattooing (Foothill Engineering Consultants, Inc. 2000). Evidence suggests that trips to the islets were short in duration because of the lack of fresh water and other resources (PRSC 2020).

The atoll also appears to have been visited by Japanese feather hunters, who supplied raw materials for fashionable turn-of-the-century women's hats. A 1923 scientific expedition conducted by the U.S. Biological Survey and the Bishop Museum with U.S. Navy sponsorship encountered evidence of two Japanese camps believed to be constructed between 1908 and 1910. The depth of the bird bone deposits encountered suggested that the feather hunters lived there for several months. In addition to the campsites, the scientists described a shrine on Wilkes Island built of columns of rock and wooden boards marked with Japanese characters. None of this reported early historic Japanese archaeological evidence is currently known to be preserved on the atoll (PRSC 2020).

Historic archaeological resources on the atoll date to the 1930s and 1940s and include remains from the Pan Am era and WWII that are contributing elements to the NHL (Foothill Engineering Consultants, Inc. 2000). However, there are no known archaeological sites identified within the APE.

3.8.2.2 Architectural Resources

Most of the historic properties at Wake Atoll are contributing elements to the Wake Island NHL, which was listed on the NRHP in 1987 as significant for its role in WWII in the Pacific. The NHL is symbolic of the initial U.S. defense, subsequent Japanese takeover, the travails of U.S. prisoners of war, and the ultimate defeat of the Imperial Japanese forces. Because of its unique location, Wake Island played a vital role in 20th century civilian and military transportation networks before and during WWII and was the site of pivotal battles won and lost, making it a significant WWII battlefield. The approximately 239 contributing elements identified to date associated with the Wake Island NHL range from American and Japanese defensive structures to memorials and shrines (Foothill Engineering Consultants, Inc. 2000; PRSC 2020). The NHL, however, is not just architectural resources. It is a summation of architectural and archaeological features, with contributing elements that are significant when taken as a whole, rather than as separate parts.

While the pre-war Japanese shrine on Wilkes Island discovered by the 1923 expedition would not be considered a site of traditional cultural importance under NEPA or NHPA, the shrine illustrated physical evidence of a cultural practice brought to the atoll.

In Summer 2007, buildings constructed after WWII (between 1946 and 1989) were evaluated for historical significance (Aaron 2008a, as cited in PRSC 2020). Those dating to 1957 or earlier were evaluated using NRHP evaluation criteria (NPS 1997). Those dating from 1958 or later were evaluated for listing in the NRHP under Criteria Consideration G, exceptional importance. The Keeper of the NRHP evaluated the findings and found that, because of the low integrity of the mostly damaged structures and little direct relationship to the major theme of trans-Pacific transportation, only two buildings were eligible for listing in the NRHP (Keeper 2010, as cited in PRSC 2020). In 2023, the 611 CES re-evaluated buildings to be demolished as part of the Proposed Action that had come of standard NRHP-qualifying age (50 years), again finding them not eligible for the NRHP due to lack of integrity and not clearly meeting NRHP criteria (Appendix A). SHPO provided their concurrence on 21 December 2023 (Appendix A). B1502, the airport terminal building—the heart of the airfield during its use for civilian trans-Pacific air travel—and B1601, the control tower and likewise a central structure for the atoll's post-war mission, were determined individually eligible for the NRHP (Aaron 2008b).

B1502 was constructed in 1962 and was determined historically significant for its place in trans-Pacific commercial airline developments after WWII, and for the central pole it played in the development of military air fueling stations in the Pacific. The building is a representative example of a modern-style, small terminal design interpreted for a tropical environment for the trans-Pacific refueling stops in the early 1960s. B1502 was verified eligible for listing in the NRHP under Criterion A, association with the broad patterns of our history. Historic American Building Survey photography and documentation of the terminal building was completed in 2008 (NPS 2008; PRSC 2020).

B1601, constructed in 1957, also has been determined to be historically significant owing to its role as a mission-critical facility in the post-WWII era. B1601 was heavily damaged in Typhoon Ioke. While part of B1601 remains in use, the tower itself is unsafe, and a Memorandum of Agreement with the SHPO provides for its scheduled demolition (PRSC 2020; USAF 2021).

3.8.2.3 Traditional/Pacific Islander Resources

As mentioned, there are oral histories of Marshallese voyages to the atoll, but no archaeological evidence of permanent settlements because of the lack of fresh water and other resources. It is also possible that the dearth of traditional archaeological sites on the atoll is due to extensive landscape modifications before and during WWII that obliterated all traces of a Polynesian presence. There are no sites of traditional Indigenous cultural or religious importance known at Wake Atoll (PRSC 2020).

3.8.3 Environmental Consequences

Impacts on cultural resources can occur by physically altering, damaging, or destroying a resource, or by altering characteristics of the surrounding environment that contribute to the resource's significance. Direct impacts entail physical changes to a historic property. Indirect effects usually occur through increased use, visual disturbance, or noise.

To evaluate impacts, historic properties are subject to the criteria of adverse effect found at 36 CFR 800.5. An adverse effect to historic properties occurs when an undertaking or action alters, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP. Adverse effects can include: (1) physical destruction of or damage to all or part of the property; (2) alteration of a property, including restoration, rehabilitation, repair, maintenance, and stabilization; (3) removal of the property from its historic location; (4) change of character in the property's use or of physical features within the property's setting that contribute to its historic significance; and (5) introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features. If an undertaking directly or indirectly affects a property in a manner that does not permanently alter its integrity or NRHP eligibility, then it is not considered an adverse effect. USAF defines an adverse effect as an indicator of a significant impact.

3.8.3.1 Proposed Action

The 611 CES has conducted both archaeological and architectural surveys of Wake Island (PRSC 2020). The entire atoll is part of the Wake Island NHL, marking the battle that took place at the outset of WWII. All existing buildings at Wake Island have been evaluated for the NRHP. Most of the NHL features are located on Peale Island and in the southern and northernmost extents of Wake Island. Post-WWII historic properties include B1601, the air traffic control building, and B1502, the current Base Ops building (PRSC 2020). Several historic properties that may experience adverse effects from the undertaking have been determined to be within the APE. The 611 CES has reviewed the criteria of adverse effect and determined that some apply to the activities that would be carried out in the Proposed Action.

The proposed construction of the new Base Ops Facility would entail the demolition of B1502, an individually eligible post-WWII historic property, and may potentially cause adverse effects to the following memorials:

- Japanese Memorial (WK-09)
- Morrison-Knudson Memorial (WK-08)
- Guam Memorial (WK-07)
- U.S. Marine Memorial (WK-06)

Of these, only the Japanese Memorial (WK-09) and U.S. Marine Memorial (WK-06) are historic properties. Both are listed as contributing elements to the NHL (PRSC 2020). While neither the Morrison-Knudson Memorial (WK-08) nor the Guam Memorial (WK-07) have been evaluated for NRHP eligibility, they will be treated as eligible.

Proposed construction of the new CSF and Base Living Quarters may potentially cause adverse effects to these NHL elements:

- Bunker, Japanese (WK-49)
- Bunker, Japanese (WK-48)

While the original site of the Japanese Memorial (WK-57) is within the APE, it is not anticipated to experience adverse effects. The original Japanese memorial that was listed as an NHL feature (WK-09) has been moved to the existing Base Ops Facility. What remains in the original location is a small post with Japanese characters, which would be avoided by all project activities.

Project impacts to B1502, Japanese Bunkers WK-48 and WK-49, as well as potential impacts on U.S. Marine Memorial WK-06, Guam Memorial WK-07, Morrison-Knudson Memorial WK-08, and Japanese Memorial WK-09 would constitute an adverse effect under Section 106 NHPA and 36 CFR 800. Per 36 CFR 800.6, the finding of “Historic Properties Affected” would be mitigated according to the terms of a Memorandum of Agreement between USAF and the Alaska SHPO, the NPS, and the Advisory Council on Historic Preservation (Appendix A), thereby reducing the impact to less than significant.

As part of Memorandum of Agreement mitigation stipulations, USAF anticipates minimizing adverse impacts on memorials WK-06, WK-07, WK-08, and WK-09 by permanently relocating the memorials to areas in front of the new Base Ops Facility. This would entail disassembling the memorials prior to project execution, then reconstructing them in an identical manner in front of the new Base Ops Facility, to be integrated with the new lawn, garden, and architectural layout of the new building. USAF remains responsible for ensuring successful implementation of these mitigations.

Proposed construction of the new aircraft parking apron would not cause effects to any of the NHL features or other potential historic properties. None of the other buildings slated for demolition as part of the undertaking are historic properties (PRSC 2020).

3.8.3.2 Summary

In summary, there would be no significant impacts on historical, architectural, archaeological, and cultural resources from the Proposed Action. No sites of traditional cultural importance or archaeological resources occur within the APE for project elements. Potential adverse effects to B1502, the WK-06, WK-07, WK-08, and WK-09 memorials, and Japanese Bunkers WK-48 and WK-49 would be mitigated per the terms of a Memorandum of Agreement to less than significant, in accordance with 36 CFR 800.6.

3.8.3.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented, and as a result, no cultural resources would be impacted. The general trend of base development would likely continue, and USAF would continue to construct, renovate, and demolish facilities as aging infrastructure is replaced or upgraded to meet evolving needs. USAF would continue to comply with the Section 106 process, the regulations set forth at 36 CFR 800, procedures in AFI 32-7605, and standard operating procedures in the WIA Integrated Cultural Resources Management Plan for these types of projects; therefore, no adverse effects to cultural resources are expected from implementation of the No Action Alternative.

3.8.4 Cumulative Impacts

As there would be no significant impacts on historical, architectural, archaeological, or cultural resources under the Proposed Action, it is unlikely that there would be significant cumulative impacts. Any development at WIA would comply with the Section 106 process, the regulations set forth at 36 CFR 800, procedures in AFI 32-7605, and standard operating procedures in the WIA Integrated Cultural Resources Management Plan for these types of projects. Mitigation measures per 36 CFR 800.6 would aim to reduce and minimize impacts and maximize historic preservation. It is thus unlikely that significant cumulative impacts on historical, architectural, archaeological, or cultural resources would occur due to the Proposed Action in combination with RFFAs.

3.9 Earth Resources

3.9.1 Definition of Resource

Earth resources consist of the earth's surface and subsurface materials. Within a given physiographic province, these resources are often described as presented in Table 3.9-1.

Table 3.9-1 Earth Resources Descriptors

DESCRIPTOR	DEFINITION
Topography and Physiography	The relative arrangement, positions, and elevations of natural and fabricated features at the earth's surface.
Geology	The distinctive, dominant, and recognizable physical characteristics and features of a volume of rock which provides information on the structure and configuration of the surface and subsurface.
Soil	The unconsolidated earthen materials overlying rock vary by structure, elasticity, strength, and shrink-swell potential. In some cases, soils are studied for compatibility with construction.
Geologic Hazards	Adverse geologic conditions capable of causing damage or loss of property and life, including seismic activity, landslides, rock falls, ground subsidence, and avalanches.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.

The Farmland Protection Policy Act (FPPA) requires that federal agencies identify and consider the adverse effects of their programs on the preservation of farmlands (7 CFR 658). The FPPA applies to farmland defined as "prime" or "unique" in Section 1540(c)(1) of the Act, or to farmland or soil of statewide or local importance as defined by the appropriate state or local agency.

3.9.2 Affected Environment

WIA's surface is formed from coral that developed around an inactive oceanic volcano's crater. Deflation of the magma chamber and subsidence and erosion, over time, reduces the extent of the volcanic cone and allows coral communities to develop around the edges (USAF 2023d). An atoll is a ring-like coral island enclosing a lagoon where the crater rim was during the volcano's active lifetime. The collective surface is formed from the Wake, Wilkes, and Peale Islands creating a "wishbone" shape with Wake Island as the dominant "V" shaped feature and Peale and Wilkes creating the wishbone's "arms" on the north and south, respectively (USAF 2023d). These features developed over time through the deposition of marine debris via rouge waves and as evidenced on portions of the atoll where former WWII infrastructure is buried under sand, cobble, and gravel (MDA 2015). The waves sometimes submerge portions of the airfield and cause significant damage to structures on the island (Jacobs 2021a). The occurrence of rogue waves has increased in frequency (USAF 2023d), which continues to influence the island's topography. As such, the island's ability to gain elevation is limited (PRSC 2022), leaving it susceptible to storm surges, high winds, and rogue waves (PRSC 2021a).

The average elevation is 12 feet above mean sea level (amsl) with a maximum elevation of 21 feet amsl (USAF 2023d). The topography is fairly even, having been leveled or excavated over time through natural disasters and actions during WWII. Wilkes and Peale Islands are characterized by more rugged terrain and overgrown vegetation. The beaches of Peale and Wake Islands consist of coral cobble on the northern seaward sides. The intertidal zone is made of ancient coral heads smoothed by contact with mobile limestone cobbles. Natural sandy terraces and embankments are infrequent but do occur along the northern coast of Peale Island and the western and northwestern shores of Wilkes Island. Some pristine white sand beaches occur on the lagoon side of Peale Island (USAF 2023d).

The ground surface is a mix of disintegrated coral and coral cobble. The geologic profile generally consists of intermixed sand, shells, coral, and limestone. The substrate is coarse-grained and almost completely composed of calcium carbonate and is droughty and desiccating to plants. Fertility is very low due to the lack of essential nutrients and organic matter. Soil formation processes are precluded by high winds, high waves, and localized inundation of the atoll. As a result, soil formation on Wake Atoll is minimal (USAF 2023d).

3.9.3 Environmental Consequences

3.9.3.1 Proposed Action

The Proposed Action would not permanently alter any landforms or significantly disrupt the island's topography. Some minor grading or fill material sources outside of WIA may be required to create an even surface prior to construction, but the adverse impacts on earth resources would be short-term, minor, direct, and localized to the project area, with long-term, minor, direct adverse impacts post-construction. Alterations to the topography would not impact the frequency of flooding or the intensity of rogue wave flows in the ROI. The Proposed Action would neither improve nor degrade soil formation or fertility in the ROI.

The Proposed Action would have no impact on "prime" or "unique" farmland because the atoll's composition does not meet the FPPA's definition of "prime" or "unique" and the USDA Soils Survey Geographic Database contains no data for Wake Island (USDA 2023). Ground-disturbing impacts during demolition or for pre-construction excavation would be short-term, moderate, direct, and adverse, but erosion control measures would be implemented if necessary to minimize potential soil erosion and accretion. Any soil or fill material brought to the island for construction would be subject to biosecurity standard operating procedures (PRSC 2015 or most recent update) on the island or applicable USDA regulatory guidelines to mitigate against importing species and agricultural goods that may be inhospitable to the island.

The Proposed Action would result in long-term, substantial, direct adverse impacts on earth resources. Ground disturbances necessary to construct new or improve existing structures would follow USAF ground-disturbing policies for WIA. New structures would be located outside of the rogue wave and storm surge inundation zones to the extent practicable and would be constructed out of materials better able to withstand the harsh environmental conditions on the island.

3.9.3.2 No Action Alternative

Under the No Action Alternative, construction, demolition, and renovation projects associated with the Proposed Action would not occur, leaving the geology, topography, and soil in the ROI unchanged when compared to existing conditions. Areas on which existing infrastructure sits would be subject to future storm surges and rogue waves causing additional erosion of accretion of the resources comprising the intermixed geologic profile. Installation land use precludes agricultural use, meaning the limited vegetation growing from the ground surface would remain unchanged, and no nutrient-rich soil would be introduced to the environment for fill or vegetative needs. Consequently, any adverse impacts from these scenarios would be short-term, negligible, and direct.

3.9.4 Cumulative Impacts

Any number of the RFFAs listed in Table 3.1-2 would add to the Proposed Action's cumulative impacts because the topography could be altered by excavation and grading or other ground disturbances. No mineral or geologic resources would be removed from the island; however, soil importation to the island could be necessary to level the earth's surface or fill other part of the ground before construction for the Proposed Action or any RFFAs begins. Cumulative impacts would be long-term, negligible, and adverse, as there are few naturally occurring earth resources and no farmland on the island.

3.10 Socioeconomic Resources/Environmental Justice

3.10.1 Definition of Resource

CEQ regulations implementing NEPA state that when economic or social effects and natural or physical environmental effects are interrelated, these effects on the human environment should be analyzed (40 CFR 1508.14). Factors that characterize the socioeconomic environment represent a composite of several interrelated and non-related attributes. Indicators of economic conditions for a geographic area can include demographics, median household income, unemployment rates, employment, and housing. Employment data identify employment by industry or trade and unemployment trends. Data on personal income in a region are used to compare the effects of jobs created or lost as a result of a proposed action. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region. Changes in demographic and economic conditions are typically accompanied by changes in other community components, such as housing availability, education, and the provision of installation and public services, which are also discussed in this section.

Environmental justice evaluates impacts on minority, low-income, elderly, and child populations. Two EOs deal directly with concerns of potentially affected communities: EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and EO 13045, Protection of Children from Environmental Health Risks and Safety Risks. EO 12898 was created to ensure 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. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, Tribal, and local programs and policies. EO 12898 requires each federal agency to identify and address whether their proposed action results in disproportionately high and adverse environmental and health impacts on low-income or minority populations. EO 13045 requires a similar analysis for children.

3.10.2 Affected Environment

The ROI for socioeconomics is defined as the geographical area within which the principal direct and secondary socioeconomic effects of actions associated with the Proposed Action would likely occur and where most consequences for local jurisdictions would be expected. The Proposed Action is localized to Wake Island. There are no communities nearby. The nearest inhabited island is Utirik Atoll in the Marshall Islands, 592 miles to the southeast. Guam, located 1,300 miles to the west, is one of the nearest U.S. territories. Hawaiʻi, the closest U.S. state, is approximately 2,000 miles to the east.

3.10.2.1 Population

Wake Island's population is comprised entirely of mission-related military personnel and government employees and contractors. There are no children or elderly people on the island. The population is not influenced by outside migration due to its heavily restricted, mission-related access.

3.10.2.2 Economic Activity

The atoll is an isolated military installation with highly controlled access. Employment is limited to military personnel and contractors who support existing operations. Local expenditures are limited to some retail goods and shelf-stable groceries sold at the shoppette Downtown (PRSC 2021), which is open 3 days a week for 1 hour each day, thereby having little to no impact on the island's military-dominated economy. There are no hotels, private residences, private retail establishments, or restaurants on the island (USAF 2023d).

3.10.2.3 Housing

Island personnel live in military-provided quarters or in a small number of private structures. As of 2023, 18 duplex units and one single-family home were occupied by civilian contractors. There is a single-family home for the Base Commander and four additional duplexes for USAF personnel or distinguished visitors (USAF 2023d). All permanent housing facilities are in inadequate condition; ongoing structural deterioration of buildings is due to the harsh climate at WIA.

Fire protection systems at the housing facilities do not meet current codes, and dormitory flooding has occurred during past tropical storms. Personnel are housed in facilities that pose health and safety hazards due to persistent mold growth and poor structural conditions caused by the humidity and high ambient salinity, which cause the premature failure of concrete and corrosion of metals. Forty percent of the rooms are uninhabitable (PRSC 2021a), and some facilities have been condemned due to falling ceilings, cracked and softened walls, and mold growth within the mechanical systems and living areas. Temporary camps are used for contractors and MDA staff (PRSC 2021a).

3.10.2.4 Education

There are no schools on the island.

3.10.2.5 Installation and Public Services

A medical clinic (B1116), DFAC (B1104), gym (B1128), and morale, welfare, and recreation facilities exist on the island (USAF 2023d). These facilities are beyond their useful life and are in advanced states of deterioration.

The medical clinic was constructed in 1961 and is experiencing structural concrete spalling, mold, and aging electrical systems. The ambulance is parked outside for lack of a garage at the clinic, and exposure to salt air has severely corroded the equipment.

The DFAC was constructed in 1961 (PRSC 2021a). No other facilities may be used as a DFAC, nor are there any commercial dining facilities off-station due to the remote nature of Wake Island. Due to the undersized food preparation area and seating area, the kitchen staff assigns mealtimes in shifts to accommodate both the island's permanent population and the transient population. Food storage is spread out around the island with freezer storage as far as a mile away, causing difficulty in maintaining minimum food safety temperatures for transported items. Inadequate air conditioning systems lead to extreme temperatures in the cooking areas that are hazardous to cooking staff health. The amount of food storage space is undersized for the amount of food delivered by barge. The DFAC building is inadequate due to structural concrete spalling, undersized electrical systems, inefficient air conditioning, and a sinking foundation in the kitchen.

The gym was built in 1970, but received lighting, fire alarm, and air conditioning improvements in recent years. These support facilities are located in the historical rogue wave inundation zone and have suffered repeated flooding and other storm damage. A post office and a gift shop are located inside B1502, the existing airport/Base Ops Facility. The airport gift shop sells retail goods when it is open. The Base Ops Facility also has vending machines and a bank that is no longer operational (PRSC 2021a). The building was constructed in 1962 and has passed its useful life span: it is corroded and has termite damage and inadequate fire protection systems. Visual inspection of the Base Ops Facility indicated that the building has a 2- to 3-year lifespan. If immediate structural reinforcements were implemented, the building’s lifespan would be extended by 7 to 10 years.

3.10.2.6 Environmental Justice

There is no established demographic structure and thus no minority, low-income, elderly, or child populations on the island as defined by environmental justice regulations. While there are certainly minorities represented in Wake Island’s mission personnel, and perhaps low-income people as well, these individuals do not meet the environmental justice definition of a minority or low-income population.

3.10.3 Environmental Consequences

3.10.3.1 Proposed Action

Socioeconomics

The Proposed Action is localized to Wake Island and would not influence the economy, education, or other social dynamics of any regional communities, which are far removed from the isolated atoll. There is almost no economy save the island’s gift shop and shoppette, and there are no schools on the island. Any economic influence from the Proposed Action would likely be attributed to construction, design, demolition, and engineering contracts for labor and materials, all of which would originate outside the ROI and are not evaluated in this analysis.

There would be no net population gain under the Proposed Action, although the population could vary during construction based on the number of laborers needed on the island and the duration of their assignments during execution of the Proposed Action. Peak population surges would have short-term, moderate to substantial, direct adverse impacts, depending on the nature and duration of the surge. Operations would return to normal following a surge.

Wake Island's permanent party and transient residents would experience long-term, substantial, direct beneficial impacts as a result of the Proposed Action. The CSF would serve as a community hub to offer a medical clinic, fitness center, laundry, and DFAC, in addition to other public services. New morale and welfare options would be available to island populations following construction, which would mitigate against the health risks that the aging infrastructure presents and bring the installation into compliance with USAF fire protection and AT/FP standards. These improvements would result in a long-term, substantial, indirect beneficial impact. The new Base Ops Facility and aircraft area improvements would have long-term, substantial, direct beneficial impacts on health and safety for personnel traveling to and from the atoll. In summary, the Proposed Action would be beneficial to the island's housing stock, to resident health and safety, and public services in general, but there would be no overall socioeconomic impact.

A comment made during the scoping process questioned whether the contractor and detachment housing locations at the proposed Base Living Quarters were too close in proximity to one another. The concern addressed the potential for fraternization between contract staff (e.g., BOS contractor) and USAF personnel leading to perception of favoritism given to one contractor working on the island over another contractor. The commentor recommended researching DoD policies that require a minimum distance between living quarters at remote installations such as WIA; however, no DoD policies or USAF standards were identified to support a housing siting location change. The Proposed Action does not violate any housing management standards and, although near each other, contractor and detachment housing are separate, distinct facilities. No operational impacts are anticipated.

Environmental Justice

The Proposed Action would have no impact on minority, low-income, elderly, or child populations because none of these populations reside on the island.

3.10.3.2 No Action Alternative

Under the No Action Alternative, existing infrastructure on the island would continue trending into disrepair, posing safety and health risks to military and civilian personnel using the buildings for daily operations. These facilities would not be demolished, and they would continue to be unable to accommodate a personnel population surge. There would be no changes in the population, economy, housing, education system, public services, or environmental justice populations, and therefore, no impact on socioeconomics and environmental justice.

3.10.4 Cumulative Impacts

There are no RFFAs that would, in conjunction with the Proposed Action, result in cumulative adverse socioeconomic or environmental justice impacts. Although several of the ongoing and planned projects could result in long-term, moderate, indirect beneficial impacts on the island's military and workforce population, the installation's isolation precludes regional economic or social influence. Unless mission-related security restrictions are modified, there would be no minority, low-income, elderly, or child populations on the island; therefore, there is no potential for cumulative impacts on environmental justice populations. Any demographic changes necessary for future installation development would be evaluated under a separate NEPA analysis.

3.11 Infrastructure and Utilities

3.11.1 Definition of Resource

Infrastructure is a manufactured array of systems and physical structures that enable a population in a specified area to function. There is a correlation between the type and extent of infrastructure available to an area and its characterization as "urban" or developed. Infrastructure provides the ability and capacity for the economic growth of an area. Components of infrastructure include utilities, solid waste management, and the transportation system. Utilities include electrical supply, water supply, sanitary sewer system, fuel supply, and stormwater drainage system.

3.11.2 Affected Environment

3.11.2.1 Road Network

There are no highways or major traffic routes on the atoll. A system of paved and unpaved roadways support operations throughout the installation. Gasoline and diesel vehicles, maintenance equipment, machinery, and bicycles are the primary forms of transportation. Wake Avenue, the island's main road, has severely degraded. The asphalt is in need of repair, which limits the use of some side roads and has safety implications for personnel using vehicles on the island. The asphalt is past its functional life and minor repairs are no longer effective (PRSC 2021a). There are no established roads on the adjacent Peale and Wilkes Islands, but historical—now overgrown—roads from the trans-Pacific aviation and WWII eras have been observed on Peale Island.

3.11.2.2 Airfield

The airfield provides industrial space for taxiways, parking aprons, cargo pads, the combined airfield terminal and Base Ops Facility, and NAVAIDS (USAF 2023d). The airport runway is 9,844 feet long and 150 feet wide (Jacobs 2021a). Parking accommodations for passenger, fighter, and cargo aircraft are dependent on the availability of space at the parking aprons and cargo pads (Jacobs 2021a).

Lighting circuits and NAVAIDS supporting runway operations are routed in underground duct banks starting at the airfield's lighting vault on the west side of the island. The duct banks continue north before they turn east and west to parallel the runway and cross again to the north. The 5-kilovolt circuit system is aging and unlikely to support additional power generation needs if required (Jacobs 2021a).

3.11.2.3 Electrical Supply

Primary electrical power on the island is produced by two sources: the Wake Island power plant and a photovoltaic solar power array. The power plant, located Downtown, contains four Cummins generator sets. The plant, rebuilt in 2009, is designed to operate with two generators sharing the baseload, a third for population surge, and a fourth for backup (PRSC 2021a). The generator set engines are fueled by JP-5, a kerosene derivative. On average, the power plant produces 69% of the daily peak demand load (Jacobs

2021a). The remaining electrical needs are supplied by the solar power array, located north of the industrial area in a field historically used as a rainwater catchment basin. It consists of 11 arrays in total, each composed of individual solar panels arranged in rows (210 per array). The ideal total solar array output is 750 kW (PRSC 2021a).

Emergency generators are interspersed throughout the island to supply electricity when necessary.

3.11.2.4 Water Supply

There are groundwater wells in various parts of Wake Island. The wells produce brackish, saline discharge from a coral aquifer (PRSC 2021a). Potable water is produced at the water plant by desalinating the water and processing it through ROWPUs (PRSC 2021a).

Drinking water is chlorinated, replenished daily, and distributed to the island using three triplex pumps and a series of shallow, buried water lines, which were replaced and installed between 2018 and 2019 (PRSC 2021a).

Non-potable water storage includes six other tanks, two of which (unused 2M-gal steel tanks) have been identified for demolition.

3.11.2.5 Wastewater System

There are 12 lift and pump stations throughout the island that send wastewater to the treatment system at Peacock Point, which consists of settlement and treatment tanks. From there, liquid moves through a leach field, while solids are dewatered through drying beds (Jacobs 2021a; PRSC 2021a; USAF comment on Initial Draft EA, 5 October 2023). Once dried, the sewage is hauled to the island's solid waste accumulation area where it is incinerated. Brackish water is not used for the sanitary sewer system (USAF 2023d). The system has deteriorated, is failing, and does not meet mission requirements; significant leaks are assumed to impact the sewer lines, while multiple lines elsewhere require "pump-around" solutions to maintain system operations (PRSC 2021a).

3.11.2.6 Stormwater System

Stormwater control measures are managed under a NPDES permit. Pollutants managed by this system include POL; solvents and pesticides; and fuels flowing through seven outfalls. Three of the outfalls are associated with the bulk fuel storage area on Wilkes Island; the other four are on Wake Island and discharge into various lagoons and grassy areas on the south and west sides of the atoll (EPA 2021). A storm discharge retention pond is in the vicinity of Parking Aprons Alpha and Bravo (PRSC 2021a). Stormwater is contained within a bermed area around the fuel tanks. The stormwater is manually released after it is inspected for sheen ensuring that POL outfall is not discharged to WOTUS. There are no wash racks on the island and no exposure pathways for cleaners and solvents to enter WOTUS (USAF, comment on Initial Draft EA, 5 October 2023).

3.11.2.7 Heating and Cooling System

Most buildings and modular facilities on the island are equipped with HVAC systems that have aged, are inadequate for island conditions, or are in an advanced state of failure. Some original units have been repaired or upgraded over time but need to be replaced to maintain ambient air temperatures for personnel working and living in installation infrastructure. The systems meet current mission requirements but have failed due to equipment corrosion and ongoing maintenance needs (PRSC 2021a).

3.11.3 Environmental Consequences

3.11.3.1 Proposed Action

Road Network

Gravel and other fill material necessary for construction would be transported to the island by barge, causing short-term, minor, direct adverse impacts on the road system during offloading or during gravel transportation throughout the ROI. A portion of the roadway near the airfield and industrial areas, including Wake Avenue, would be rerouted to accommodate the new apron and Base Ops Facility (Jacobs 2021b). The new CSF and Base Living Quarters would be located further north along Wake Avenue. The Proposed Action would have long-term, minor, direct beneficial impacts on the road network by optimizing space utilization and traffic flow following project implementation.

There would be short-term, moderate, direct adverse impacts on traffic flow and AQ during construction. Traffic congestion would be minimized by road closures or reroute signage and communication protocols. Fugitive dust affecting AQ would be mitigated through reduced speed limits and the application of dust suppression products that would decrease the amount of particulate matter in the air due to wind, vehicles, and other operations. Dust minimization and mitigation measures near the parking apron expansion would be equally critical to prevent dust impacts on aquatic life and nearshore waters surrounding the atoll.

Electrical Supply

WIA utilities include a series of shallow electrical lines buried throughout the airfield and the industrial area. Under the Proposed Action, existing lines would be re-routed, or new lines would be constructed and tied into the current lines to supply electricity to the Proposed Action's new or improved structures. Excavation to modify the electrical lines would temporarily disturb earth resources. Spoils would be placed back into the trench after the electrical lines are installed. The impacts would be short-term, negligible, direct, and adverse. No net population gain is expected as a result of the Proposed Action, and new facilities would not consume more electricity than the existing or condemned facilities on the island; therefore, an increase in electrical power demand is not expected.

Water Supply

New water lines would be constructed and tied into existing laterals to carry water from the water treatment plant to the proposed facilities. This would require temporary ground disturbance during excavation. Spoils would be placed back into the trench following installation of the water utility lines. Impacts during construction would be short-term, negligible, direct, and adverse.

No net population gain is expected as a result of the Proposed Action; therefore, an increase in domestic water consumption is not expected to support installation operations. The ROWPUs installed in FY2024 have the production capacity to meet the projected demand for potable water during surge events (USAF 2024c). It is uncertain whether the water line and water storage facilities would be able to sustain surge demand; however, this would be the case regardless of whether the Proposed Action were implemented, and in fact, the Proposed Action would have a negligibly beneficial impact by reducing the available housing capacity, thereby lessening the demand. Therefore, the Proposed Action would not have a significant adverse impact on water supply.

Wastewater System

New wastewater lines would be constructed to tie the new facilities under the Proposed Action to the current wastewater system. Line routing would be determined by final engineering designs and compatibility with other utilities, airfield Clear Zones, and infrastructure adjacent to the lines. Excavation would temporarily disturb earth resources during excavation. The spoils would be placed back into the trench to bury the wastewater lines following installation. Construction impacts would be short-term, negligible, direct, and adverse. Post-construction, the upgraded sewer lines would have long-term, negligible, indirect beneficial impacts on the wastewater system as a whole. The Proposed Action would not cause additional demand on the wastewater system, as it would not result in a population increase; however, a maximum population surge would substantially impact wastewater treatment capabilities (PRSC 2021a) and could contribute to future blockages and leaks within the sewer lines, the duration and intensity of which would be unknown until a system failure occurs and warrants an assessment. This would be the case regardless of whether the Proposed Action was implemented and not a direct result of it; therefore, the Proposed Action would not have a significant adverse impact on the wastewater system. Should a population increase or system failure occur, potential impacts would be evaluated under a separate NEPA analysis.

Stormwater System

The total project footprint would disturb approximately 61 acres in the ROI. Soil disturbance from construction and demolition would temporarily disrupt existing human-made stormwater drainage systems and natural drainage patterns through soil erosion and sediment production. These impacts would be short-term, negligible, direct, and adverse. A site-specific SWPPP addressing soil erosion, sediment controls, and construction site waste controls would be required, as discussed in Section 3.4.3.1. Disturbances exceeding 1 acre would require a CGP issued by EPA to ensure that discharges do not harm water quality or human health.

Heating and Cooling System

The Proposed Action would include new or upgraded heating and cooling systems, thereby reducing the risk of a system failure in these buildings. There are no plans to improve or replace the existing systems in buildings unaffiliated with the Proposed Action. New cooling systems would improve working conditions for BOS staff responsible for daily meals on the island by reducing the facility’s interior temperature. In addition to the improved interior conditions, the new DFAC would have larger food coolers onsite, minimizing the chances of food-related health and safety concerns by consolidating food items to the CSF rather than interspersing them throughout different island facilities. New cooling systems in the Base Ops Facility, CSF, and Base Living Quarters would provide safer indoor temperature conditions for personnel during the warmest seasonal conditions on the island. Heating system upgrades would provide ambient indoor temperatures when necessary. The impacts would be long-term, substantial, direct, and beneficial by improving indoor ambient air temperatures and replacing aged systems in near states of failure.

3.11.3.2 No Action Alternative

Under the No Action Alternative, construction of a new CSF, Base Ops Facility, Base Living Quarters, and paved parking apron would not occur. The infrastructure and utilities identified for upgrades or replacement would remain unchanged and likely fall into further states of disrepair, resulting in long-term, minor, indirect adverse impacts. WIA’s IDP would guide maintenance and repair plans consistent with current and future projects. If a future project would change infrastructure and utility needs on WIA, PACAF would evaluate the project to ensure compatibility with the existing systems and minimize adverse impacts.

3.11.4 Cumulative Impacts

A number of potential utilities and infrastructure projects would contribute to overall cumulative impacts on the island. Repairs to the sanitary sewer system and road network were planned for FY2021 and FY2022, respectively. The island-wide rat eradication project would require mitigation measures to prevent pesticides from migrating into the stormwater system (USAF, comment on Initial Draft EA, 5 October 2023). Those measures would likely be dictated under permitting stipulations prior to eradication. The former plumbing shop (B1304) could be replaced in FY2024 and well pump houses (B1308 and B1309) could be repaired during FY2025. A non-functioning electrical power building (B950) may also be demolished in FY2025. The Petroleum Operations Office building (B1509) could be repaired; the harbor and fuels pier may be improved; and the bridge to Peale Island, the only form of overland access between Wake and Peale, which burned down in 2003, may be rebuilt during FY2026. A new bulk fuel storage tank area could be added, and the ROWPU system, upgraded in 2023, is equipped to meet population surge demands for potable water. All these improvements would cause temporary, moderate, cumulative adverse impacts during construction that would be minimized by phasing the projects over several years. The long-term cumulative impacts would be substantial and beneficial. The potential projects would bring aging or inoperable equipment into compliance with safety and construction standards and would offer improved public services to personnel living on the island.

3.12 Other NEPA Considerations

3.12.1 Unavoidable Adverse Effects

In accordance with 40 CFR 1508.27, this EA identifies any unavoidable adverse impacts from the Proposed Action. Energy supplies would be committed to the Proposed Action, which would require the continued use of non-renewable fossil fuels during construction and ongoing operations. Non-renewable resource use under the Proposed Action is an unavoidable occurrence, although not considered significant.

Unavoidable short-term, minor, direct adverse impacts associated with the Proposed Action would include temporary erosion and sedimentation from soil disturbance; a temporary increase in fugitive dust and air emissions during construction; intermittent noise; and alterations to local traffic and airfield operations. These impacts would be confined to the immediate area and would be minimized by implementing environmental controls required by permits and approvals. Unavoidable long-term, substantial, direct adverse impacts on approximately 0.11 acres of WOTUS would occur from construction of the new parking apron but would not be expected to significantly impact the chemical, physical, or biological integrity of the nation’s waters. A Section 404 permit for discharge of dredged or fill material to WOTUS and a Section 10 permit for excavation or deposition in navigable WOTUS would be obtained, and BMPs would be employed to minimize impacts on wetlands and other WOTUS. Unavoidable short-term, substantial, direct adverse impacts on birds protected under the MBTA would occur from removal of nesting habitat during construction; however, the impacted vegetation represents a negligible amount of habitat loss compared to the total acreage of vegetation on the atoll. Impacts would be minimized by implementing BMPs and conservation measures developed in consultation with the USFWS.

3.12.2 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between short-term uses and enhancement of long-term productivity from the Proposed Action is evaluated from the standpoint of short-term and long-term effects. Under the Proposed Action, short-term uses of the environment would result in noise and air emissions from construction equipment, demolition activities, and traffic operations. Noise and air emissions would not be expected to result in long-term adverse impacts on noise-sensitive receptors or wildlife due to the interim nature of proposed construction and because local wildlife is likely habituated to construction and traffic and wildlife habitat would not be significantly impacted.

The Proposed Action represents an enhancement of long-term productivity for WIA’s operations and support needs. The negative effects of short-term operational changes during construction would be minor compared to the positive effects from improved infrastructure and billeting capacity. Immediate and long-term benefits would be realized for operations and maintenance.

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Table 4.1-1 List of Preparers

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Notes:
For definitions, refer to the Acronyms and Abbreviations section.

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N/A	
PACIFIC ISLANDER OR NATIVE HAWAIIAN ORGANIZATIONS	
N/A	

Notes:
For definitions, refer to the Acronyms and Abbreviations section.

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APPENDIX A
INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND PUBLIC PARTICIPATION

[TO BE INCLUDED IN FINAL]

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APPENDIX B
ACAM ANALYSIS REPORT

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AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

1. General Information: The United States Air Force (USAF) Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the Proposed Action in accordance with Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:
Base: OVERSEAS BASE
State: U.S. Minor Outlying Islands
County(s): Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: Construction of a New Base Operations Facility, Consolidated Base Support Facility, Base Living Quarters, and Aircraft Parking Apron at Wake Island Airfield

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2029

e. Action Description: The Proposed Action would construct a total of 22 new buildings; demolish 49 dilapidated Cold War-era buildings; relocate memorials; and reroute Wake Avenue. Alternatives considered but not carried forward include 1) constructing the new Base Operations Facility at its current location and other facilities on Peale Island and 2) repairing all buildings to acceptable standards.

f. Point of Contact:

Name:	Mandy Hope
Title:	Contractor
Organization:	Brice Environmental Services Corporation
Email:	mandy.hope@bricesolutions.com
Phone Number:	907-342-7943

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total net direct and indirect emissions associated with the Proposed Action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQS). These insignificance indicators are the 250 tons/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the General Conformity Rule de minimis values (25 tons/yr for lead and 100 tons/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance of one or more NAAQS. For further detail on insignificance indicators, see Chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

For each pollutant, the action's net emissions for every year through achieving steady state were compared against the associated insignificance indicator. The results are summarized below.

Analysis Summary:

2029

Pollutant	Action Emissions (tons/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (tons/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.097	250	
NOx	3.883	250	
CO	7.535	250	
SOx	0.002	250	
PM 10	2.194	250	
PM 2.5	0.129	250	
Pb	0.000	25	No
NH3	0.021	250	
CO2e	1239.6		

2030

Pollutant	Action Emissions (tons/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (tons/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	8.489	250	
NOx	10.021	250	
CO	19.282	250	
SOx	0.031	250	
PM 10	45.094	250	
PM 2.5	0.364	250	
Pb	0.000	25	No
NH3	0.057	250	
CO2e	3501.1		

2031 - (Steady State)

Pollutant	Action Emissions (tons/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (tons/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	250	
NOx	0.000	250	
CO	0.000	250	
SOx	0.000	250	
PM 10	0.000	250	
PM 2.5	0.000	250	
Pb	0.000	25	No
NH3	0.000	250	
CO2e	0.0		

None of the estimated annual net emissions associated with the Proposed Action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the Proposed Action will not cause or contribute to an exceedance of one or more NAAQS. No further air assessment is needed.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF AIR ANALYSIS (ROAA)

Mandy Hope
Mandy Hope, Contractor

8/15/24
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: OVERSEAS BASE
State: U.S. Minor Outlying Islands
County(s): Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Construction of a New Base Operations Facility, Consolidated Base Support Facility, Base Living Quarters, and Aircraft Parking Apron at Wake Island Airfield

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2029

- Action Purpose and Need:
The purpose of the Proposed Action is to construct a new Base Operations Facility, Consolidated Base Support Facility (CSF), Base Living Quarters, and aircraft parking apron at Wake Island that meet USAF safety standards and mission priorities.

Existing facilities on Wake Island were constructed in the 1960s and the deteriorated buildings are approaching the end of their serviceable lifespan. Problems include failing infrastructure; mold; inadequate internal systems (e.g., heating, ventilation, and air conditioning [HVAC], fire suppression, electrical); and insufficient storage, housing, and office space. In addition, they are located within historic rogue wave and storm surge inundation zones, and do not meet current USAF building and safety standards.

- Action Description:
The Proposed Action would construct a total of 22 new buildings; demolish 49 dilapidated Cold War-era buildings; relocate memorials; and reroute Wake Avenue. Alternatives considered but not carried forward include 1) constructing the new Base Operations Facility at its current location and other facilities on Peale Island and 2) repairing all buildings to acceptable standards.

- Point of Contact

Name: Mandy Hope
Title: Contractor
Organization: Brice Environmental Services Corporation
Email: mandy.hope@bricesolutions.com
Phone Number: 907-342-7943

- Activity List:

No.	Activity Type	Activity Title
1	Construction / Demolition	Demo B106 Former Chapel
2	Construction / Demolition	Demo B201 Water Pump Station #2
3	Construction / Demolition	Demo B202 Non-Potable Water Supply Building
4	Construction / Demolition	Demo B1103 Base Laundry Facility
5	Construction / Demolition	Demo B1104 Dining Facility
6	Construction / Demolition	Demo B1105 Cold Storage BSE
7	Construction / Demolition	Demo B1107 Cold Storage BSE
8	Construction / Demolition	Demo B1116 Dorm/Clinic/Billeting
9	Construction / Demolition	Demo B1128 Gym, Open Berth
10	Construction / Demolition	Demo B1502 Passenger Terminal and Base Operations
11	Construction / Demolition	Demo B1503 Terminal Generator Building

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

12	Construction / Demolition	Demo B1504 Old Fire Station
13	Construction / Demolition	Demo B1513 Warehouse Supply/Equipment
14	Construction / Demolition	Demo B1514 BE Maintenance Shop
15	Construction / Demolition	Demo B1515
16	Construction / Demolition	Demo B1519 Warehouse Supply & Equipment
17	Construction / Demolition	Demo B1522 Fire Station #2
18	Construction / Demolition	Demo B1550
19	Construction / Demolition	Demo B1551
20	Construction / Demolition	Demo B2100 Golf Course Clubhouse
21	Construction / Demolition	Demo old parking apron
22	Construction / Demolition	Demo B1115 Dorm, VOQ, O1-O10
23	Construction / Demolition	Demo B1117 Dorm/AM PP/PCS-STD
24	Construction / Demolition	Demo B1118 Dorm/AM PP/PCS-STD
25	Construction / Demolition	Demo B1120 Dorm/AM PP/PCS-STD
26	Construction / Demolition	Demo B1401 Base Engr Admin
27	Construction / Demolition	Demo B1402 Supply Warehouse
28	Construction / Demolition	Demo B1403 Vehicle Maintenance Shop
29	Construction / Demolition	Demo B1406 Vehicle Maintenance Shop
30	Construction / Demolition	Demo B1408 BE Maintenance Shop
31	Construction / Demolition	Demo B1409 BE Maintenance Shop
32	Construction / Demolition	Demo B1410 BE Maintenance Shop
33	Construction / Demolition	Demo B1411 Engine Repair Shop
34	Construction / Demolition	Demo B1416
35	Construction / Demolition	Construct CSF
36	Construction / Demolition	Construct Generator Building
37	Construction / Demolition	Reroute Wake Avenue
38	Construction / Demolition	Construct North Bravo Parking Apron
39	Construction / Demolition	Construct Dining Facility
40	Construction / Demolition	Construct Multi-Purpose Facility
41	Construction / Demolition	Construct Generator Building
42	Construction / Demolition	Construct Picnic Pavilion #1
43	Construction / Demolition	Construct Picnic Pavilion #2
44	Construction / Demolition	Construct Short Term Visiting Airman Dorm #1
45	Construction / Demolition	Construct Short Term Visiting Airman Dorm #2
46	Construction / Demolition	Construct Short Term Visiting Airman Dorm #3
47	Construction / Demolition	Construct Long Term Visiting Airman Dorm
48	Construction / Demolition	Construct Permanent Party Airman Dorm #1
49	Construction / Demolition	Construct Permanent Party Airman Dorm #2
50	Construction / Demolition	Construct Unaccompanied NCO Dormitory
51	Construction / Demolition	Construct DET Staff Duplex #1
52	Construction / Demolition	Construct DET Staff Duplex #2
53	Construction / Demolition	Construct DV Duplex
54	Construction / Demolition	Construct DET CC House
55	Emergency Generator	Remove B1100 DFAC Emergency Generator
56	Emergency Generator	Remove B1503 Passenger Terminal Emergency Generator

57	Emergency Generator	Install New Emergency Generator - Base Operations
58	Emergency Generator	Install New Emergency Generator - Base Support
59	Construction / Demolition	Base Ops New Pavements
60	Construction / Demolition	CSF New Pavements
61	Construction / Demolition	BLQ New Pavements
62	Construction / Demolition	Demo B506
63	Construction / Demolition	Demo B626, Officers Quarters CES/CC
64	Construction / Demolition	Demo B921 Dormitory Airman Permanent
65	Construction / Demolition	Demo B944 Officers Quarters
66	Construction / Demolition	Demo B1009 Officers Quarters Station Manager
67	Construction / Demolition	Demo B1010 Officers Quarters
68	Construction / Demolition	Demo B1011 Officers Quarters
69	Construction / Demolition	Demo B1012 Officers Quarters
70	Construction / Demolition	Demo B1013 Officers Quarters
71	Construction / Demolition	Demo B1014 Officers Quarters
72	Construction / Demolition	Demo B1015 Officers Quarters
73	Construction / Demolition	Demo B1016 Officers Quarters
74	Construction / Demolition	Demo B1017 Officers Quarters
75	Construction / Demolition	Demo B1018 Officers Quarters

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.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B106 Former Chapel

- Activity Description:
Demolish a 2,452-SF facility in support of the Base Operations Facility project.

- Activity Start Date
Start Month: 1
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013024
SO_x	0.000233

Pollutant	Total Emissions (TONs)
PM 2.5	0.002463
Pb	0.000000

NO_x	0.070479
CO	0.138007
PM 10	0.012808

NH_3	0.000320
CO_2e	21.3

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2452
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

2.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	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

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B201 Water Pump Station #2

- Activity Description:
Demolish a 402 (584 in IDP)-SF Building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 1
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.002969
SO_x	0.000053
NO_x	0.016234
CO	0.031245
PM 10	0.001759

Pollutant	Total Emissions (TONs)
PM 2.5	0.000567
Pb	0.000000
NH_3	0.000068
CO_2e	4.9

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3.1 Demolition Phase

3.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 7

3.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 402
Height of Building to be demolished (ft): 14

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

3.1.4 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

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B202 Non-Potable Water Supply Building

- Activity Description:
Demolish a 90 (142 in IDP)-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 1
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.002941
SO_x	0.000053
NO_x	0.016211
CO	0.030783
PM 10	0.000841

Pollutant	Total Emissions (TONs)
PM 2.5	0.000567
Pb	0.000000
NH_3	0.000064
CO_2e	4.9

4.1 Demolition Phase

4.1.1 Demolition Phase Timeline Assumptions

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- Phase Start Date
Start Month: 1
Start Quarter: 3
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 7

4.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 90
Height of Building to be demolished (ft): 14

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

4.1.4 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

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1103, Base Laundry Facility

- Activity Description:
Demolish a 3,526-SF facility in support of the CSF project.

- Activity Start Date
Start Month: 2
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013163
SO_x	0.000235
NO_x	0.070593
CO	0.140281
PM 10	0.017325

Pollutant	Total Emissions (TONs)
PM 2.5	0.002466
Pb	0.000000
NH_3	0.000341
CO_2e	21.4

5.1 Demolition Phase

5.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2029

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 3526
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

5.1.4 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

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1104 Dining Facility

- Activity Description:
Demolish an 8,715-SF building in support of the CSF project.

- Activity Start Date
Start Month: 3
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 3
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013833
SO_x	0.000245
NO_x	0.071144
CO	0.151271
PM 10	0.039148

Pollutant	Total Emissions (TONs)
PM 2.5	0.002480
Pb	0.000000
NH_3	0.000441
CO_2e	22.0

6.1 Demolition Phase

6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

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6.1.2 Demolition Phase Assumptions

- General Demolition Information

Area of Building to be demolished (ft^2): 8715
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

6.1.4 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

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1105 Cold Storage BSE

- Activity Description:
Demolish a 2,485-SF building in support of the CSF project.

- Activity Start Date
Start Month: 4
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006186
SO_x	0.000110
NO_x	0.032673
CO	0.066561
PM 10	0.011603

Pollutant	Total Emissions (TONs)
PM 2.5	0.001140
Pb	0.000000
NH_3	0.000174
CO_2e	10.0

7.1 Demolition Phase

7.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 14

7.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2485

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Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

7.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

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$PM10_{FD}$ = (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

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1107 Cold Storage BSE

- Activity Description:
Demolish a 1,174 (1,152 in IDP)-SF building in support of the CSF project.

- Activity Start Date
Start Month: 4
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	0.006017	PM 2.5	0.001137
SO_x	0.000108	Pb	0.000000
NO_x	0.032533	NH_3	0.000148
CO	0.063785	CO_2e	9.8
PM 10	0.006089		

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 3
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 14

8.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 1174
Height of Building to be demolished (ft): 20

- Default Settings Used: No

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

8.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

8.1.4 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

9. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

9.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1116 Dorm/Clinic/Billeting

- Activity Description:
Demolish a 6,962-SF building in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 5
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.014507
SO_x	0.000254
NO_x	0.071697
CO	0.162302
PM 10	0.061056

Pollutant	Total Emissions (TONs)
PM 2.5	0.002495
Pb	0.000000
NH_3	0.000542
CO_2e	22.5

9.1 Demolition Phase

9.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

9.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 6962
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day

Concrete/Industrial Saws 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): 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

9.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

9.1.4 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

10. Construction / Demolition

10.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1128 Gym, Open Berth

- Activity Description:
Demolish a 12,917-SF building in support of the CSF project.

- Activity Start Date
Start Month: 6
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.015442
SO_x	0.000267
NO_x	0.072465
CO	0.177623
PM 10	0.091480

Pollutant	Total Emissions (TONs)
PM 2.5	0.002516
Pb	0.000000
NH_3	0.000683
CO_2e	23.2

10.1 Demolition Phase

10.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

10.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 10579
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

10.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

10.1.4 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

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1502 Passenger Terminal and Base Operations

- Activity Description:

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Demolish a 17,715 (25,778 in IDP)-SF building in support of the Base Operations Facility project.

- Activity Start Date
Start Month: 5
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.017286
SO_x	0.000294
NO_x	0.073980
CO	0.207848
PM 10	0.151504

Pollutant	Total Emissions (TONs)
PM 2.5	0.002557
Pb	0.000000
NH_3	0.000960
CO_2e	24.7

11.1 Demolition Phase

11.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

11.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 17715
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

11.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

11.1.4 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

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1503 Terminal Generator Building

- Activity Description:
Demolish a 440-SF building in support of the Base Operations Facility project.

- Activity Start Date
Start Month: 2
Start Month: 2029

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- Activity End Date
Indefinite: False
End Month: 2
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.002989
SO_x	0.000054
NO_x	0.016251
CO	0.031581
PM 10	0.002426

Pollutant	Total Emissions (TONs)
PM 2.5	0.000568
Pb	0.000000
NH_3	0.000071
CO_2e	4.9

12.1 Demolition Phase

12.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 7

12.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 440
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

12.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

12.1.4 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

13. Construction / Demolition

13.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1504 Old Fire Station

- Activity Description:
Demolish a 6,895-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 4
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2029

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- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.014044
SO_x	0.000248
NO_x	0.071317
CO	0.154717
PM 10	0.045993

Pollutant	Total Emissions (TONs)
PM 2.5	0.002485
Pb	0.000000
NH_3	0.000473
CO_2e	22.1

13.1 Demolition Phase

13.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

13.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 6895
Height of Building to be demolished (ft): 30

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

13.1.3 Demolition Phase Emission Factor(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

13.1.4 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

14. Construction / Demolition

14.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1513 Warehouse Supply/Equipment

- Activity Description:
Demolish a 3,881-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 4
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013460
SO_x	0.000239
NO_x	0.070837

Pollutant	Total Emissions (TONs)
PM 2.5	0.002472
Pb	0.000000
NH_3	0.000385

CO	0.145143		CO_2e	21.7
PM 10	0.026979			

14.1 Demolition Phase

14.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

14.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 3881
Height of Building to be demolished (ft): 30

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

14.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539

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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

14.1.4 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

15. Construction / Demolition

15.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1514 BE Maintenance Shop

- Activity Description:
Demolish a 7,306-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 4
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013651
SO_x	0.000242
NO_x	0.070995
CO	0.148287
PM 10	0.033223

Pollutant	Total Emissions (TONs)
PM 2.5	0.002476
Pb	0.000000
NH_3	0.000414
CO_2e	21.8

15.1 Demolition Phase

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15.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

15.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 7306
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

15.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
Tractors/Loaders/Backhoes Composite								

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	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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

15.1.4 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

16. Construction / Demolition

16.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1515

- Activity Description:
Demolish a 77-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 3
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 3
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.002454
SO_x	0.000044
NO_x	0.013512
CO	0.025704
PM 10	0.000804

Pollutant	Total Emissions (TONs)
PM 2.5	0.000472
Pb	0.000000
NH_3	0.000054
CO_2e	4.1

16.1 Demolition Phase

16.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

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Start Month: 3
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 5

16.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 77
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

16.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

16.1.4 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

17. Construction / Demolition

17.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1519 Warehouse Supply & Equipment

- Activity Description:
Demolish a 19,914-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 6
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.016568
SO_x	0.000283
NO_x	0.073390
CO	0.196075
PM 10	0.128125

Pollutant	Total Emissions (TONs)
PM 2.5	0.002541
Pb	0.000000
NH_3	0.000852
CO_2e	24.1

17.1 Demolition Phase

17.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2029

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- Phase Duration
Number of Month: 1
Number of Days: 0

17.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 19914
Height of Building to be demolished (ft): 30

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

17.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

17.1.4 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

18. Construction / Demolition

18.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1522 Fire Station #2

- Activity Description:
Demolish a 9,273 (9,075 in IDP)-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 8
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.014505
SO_x	0.000254
NO_x	0.071696
CO	0.162272
PM 10	0.060995

Pollutant	Total Emissions (TONs)
PM 2.5	0.002495
Pb	0.000000
NH_3	0.000542
CO_2e	22.5

18.1 Demolition Phase

18.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

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18.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 9273
Height of Building to be demolished (ft): 30

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

18.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

18.1.4 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

19. Construction / Demolition

19.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1550

- Activity Description:
Demolish a 435-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 7
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.002989
SO_x	0.000054
NO_x	0.016251
CO	0.031571
PM 10	0.002405

Pollutant	Total Emissions (TONs)
PM 2.5	0.000568
Pb	0.000000
NH_3	0.000071
CO_2e	4.9

19.1 Demolition Phase

19.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 7

19.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 435

Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

19.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

19.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

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$PM10_{FD}$ = (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

20. Construction / Demolition

20.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1551

- Activity Description:
Demolish a 451-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 7
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.002991
SO_x	0.000054
NO_x	0.016252
CO	0.031604
PM 10	0.002473

Pollutant	Total Emissions (TONs)
PM 2.5	0.000568
Pb	0.000000
NH_3	0.000072
CO_2e	4.9

20.1 Demolition Phase

20.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 2
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 7

20.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 451
Height of Building to be demolished (ft): 20

- Default Settings Used: No

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

20.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

20.1.4 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

21. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

21.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B2100 Golf Course Clubhouse

- Activity Description:
Demolish a 1,519-SF building in support of the CSF project.

- Activity Start Date
Start Month: 5
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.012904
SO_x	0.000231
NO_x	0.070380
CO	0.136031
PM 10	0.008884

Pollutant	Total Emissions (TONs)
PM 2.5	0.002460
Pb	0.000000
NH_3	0.000302
CO_2e	21.2

21.1 Demolition Phase

21.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

21.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 1519
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day

Concrete/Industrial Saws 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): 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

21.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

21.1.4 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

22. Construction / Demolition

22.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo old parking apron

- Activity Description:
Demolish approximately 650,000 SF of concrete and asphalt parking apron in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 8
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 9
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.111032
SO_x	0.001904
NO_x	0.597316
CO	0.701508
PM 10	0.091299

Pollutant	Total Emissions (TONs)
PM 2.5	0.022902
Pb	0.000000
NH_3	0.000996
CO_2e	179.6

22.1 Demolition Phase

22.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 2
Number of Days: 0

22.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 650000
Height of Building to be demolished (ft): 0.5

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	3	8
Rubber Tired Dozers Composite	2	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

22.1.3 Demolition 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
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

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

22.1.4 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

23. Construction / Demolition

23.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1115 Dorm, VOQ, O1-O10

- Activity Description:
Demolish a 10,579-SF building in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 7

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Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.015442
SO_x	0.000267
NO_x	0.072465
CO	0.177623
PM 10	0.091480

Pollutant	Total Emissions (TONs)
PM 2.5	0.002516
Pb	0.000000
NH_3	0.000683
CO_2e	23.2

23.1 Demolition Phase

23.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

23.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 10579
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

23.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

23.1.4 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

24. Construction / Demolition

24.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1117 Dorm/AM PP/PCS-STD

- Activity Description:
Demolish a 10,570-SF building in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 8
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2029

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- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.015442
SO_x	0.000267
NO_x	0.072465
CO	0.177623
PM 10	0.091480

Pollutant	Total Emissions (TONs)
PM 2.5	0.002516
Pb	0.000000
NH_3	0.000683
CO_2e	23.2

24.1 Demolition Phase

24.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

24.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 10579
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

24.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

24.1.4 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

25. Construction / Demolition

25.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1118 Dorm/AM PP/PCS-STD

- Activity Description:
Demolish a 7,131-SF building in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 9
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 9
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.014550
SO_x	0.000255

Pollutant	Total Emissions (TONs)
PM 2.5	0.002496
Pb	0.000000

NO_x	0.071733		NH_3	0.000549
CO	0.163018		CO_2e	22.5
PM 10	0.062478			

25.1 Demolition Phase

25.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

25.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 7131
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

25.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

25.1.4 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

26. Construction / Demolition

26.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1120 Dorm/AM PP/PCS-STD

- Activity Description:
Demolish a 7,683-SF building in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 10
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.014693
SO_x	0.000257
NO_x	0.071850
CO	0.165356
PM 10	0.067121

Pollutant	Total Emissions (TONs)
PM 2.5	0.002499
Pb	0.000000
NH_3	0.000570
CO_2e	22.6

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26.1 Demolition Phase

26.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

26.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 7683
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

26.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

26.1.4 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

27. Construction / Demolition

27.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1401 Base Engr Admin

- Activity Description:
Demolish a 3,313-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 7
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013135
SO_x	0.000235
NO_x	0.070571
CO	0.139830
PM 10	0.016429

Pollutant	Total Emissions (TONs)
PM 2.5	0.002465
Pb	0.000000
NH_3	0.000337
CO_2e	21.4

27.1 Demolition Phase

27.1.1 Demolition Phase Timeline Assumptions

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- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

27.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 3313
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

27.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

27.1.4 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

28. Construction / Demolition

28.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1402 Supply Warehouse

- Activity Description:
Demolish a 29,526 (25,301 in IDP)-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 9
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 9
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.017733
SO_x	0.000300
NO_x	0.074348
CO	0.215174
PM 10	0.166052

Pollutant	Total Emissions (TONs)
PM 2.5	0.002567
Pb	0.000000
NH_3	0.001027
CO_2e	25.0

28.1 Demolition Phase

28.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

28.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 25926
Height of Building to be demolished (ft): 30

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

28.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

28.1.4 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

29. Construction / Demolition

29.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1403 Vehicle Maintenance Shop

- Activity Description:
Demolish a 9,993-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 10
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013999
SO_x	0.000247
NO_x	0.071280
CO	0.153977
PM 10	0.044523

Pollutant	Total Emissions (TONs)
PM 2.5	0.002484
Pb	0.000000
NH_3	0.000466
CO_2e	22.1

29.1 Demolition Phase

29.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

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29.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 9993
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

29.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

29.1.4 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

30. Construction / Demolition

30.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1406 Vehicle Maintenance Shop

- Activity Description:
Demolish a 4,056 (4,137 in IDP)-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 10
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013231
SO_x	0.000236
NO_x	0.070650
CO	0.141404
PM 10	0.019554

Pollutant	Total Emissions (TONs)
PM 2.5	0.002467
Pb	0.000000
NH_3	0.000351
CO_2e	21.5

30.1 Demolition Phase

30.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

30.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4056

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Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

30.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

30.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

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$PM10_{FD}$ = (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

31. Construction / Demolition

31.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1408 BE Maintenance Shop

- Activity Description:
Demolish a 6,356-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 11
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013529
SO_x	0.000240
NO_x	0.070894
CO	0.146275
PM 10	0.029227

Pollutant	Total Emissions (TONs)
PM 2.5	0.002474
Pb	0.000000
NH_3	0.000396
CO_2e	21.7

31.1 Demolition Phase

31.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

31.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 6356
Height of Building to be demolished (ft): 20

- Default Settings Used: No

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- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

31.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

31.1.4 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

32. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

32.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1409 BE Maintenance Shop

- Activity Description:
Demolish a 4,038-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 12
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013229
SO_x	0.000236
NO_x	0.070648
CO	0.141366
PM 10	0.019478

Pollutant	Total Emissions (TONs)
PM 2.5	0.002467
Pb	0.000000
NH_3	0.000351
CO_2e	21.5

32.1 Demolition Phase

32.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

32.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 4038
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day

Concrete/Industrial Saws 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): 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

32.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

32.1.4 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

33. Construction / Demolition

33.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1410 BE Maintenance Shop

- Activity Description:
Demolish a 2,811-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 1
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013070
SO_x	0.000234
NO_x	0.070517
CO	0.138767
PM 10	0.014318

Pollutant	Total Emissions (TONs)
PM 2.5	0.002464
Pb	0.000000
NH_3	0.000327
CO_2e	21.4

33.1 Demolition Phase

33.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

33.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2811
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

33.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

33.1.4 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

34. Construction / Demolition

34.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1411 Engine Repair Shop

- Activity Description:

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Demolish a 1,047-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 2
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.012843
SO_x	0.000231
NO_x	0.070330
CO	0.135031
PM 10	0.006899

Pollutant	Total Emissions (TONs)
PM 2.5	0.002459
Pb	0.000000
NH_3	0.000293
CO_2e	21.2

34.1 Demolition Phase

34.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

34.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 1047
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

34.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

34.1.4 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

35. Construction / Demolition

35.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1416

- Activity Description:
Demolish a 1,237-SF building in support of the North Bravo Parking Apron project.

- Activity Start Date
Start Month: 3
Start Month: 2029

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity End Date
Indefinite: False
End Month: 3
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.012867
SO_x	0.000231
NO_x	0.070350
CO	0.135434
PM 10	0.007698

Pollutant	Total Emissions (TONs)
PM 2.5	0.002459
Pb	0.000000
NH_3	0.000296
CO_2e	21.2

35.1 Demolition Phase

35.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

35.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 1237
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

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- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

35.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

35.1.4 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

36. Construction / Demolition

36.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Base Operations Facility

- Activity Description:
Construct a 27,983-SF Base Operations Facility to include base operations, passenger terminal, and air traffic control tower.

- Activity Start Date
Start Month: 5
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2029

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- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.544216
SO_x	0.004077
NO_x	1.083186
CO	2.069296
PM 10	0.406531

Pollutant	Total Emissions (TONs)
PM 2.5	0.037417
Pb	0.000000
NH_3	0.005702
CO_2e	364.7

36.1 Site Grading Phase

36.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
- **Start Month:** 5
- **Start Quarter:** 1
- **Start Year:** 2029

- Phase Duration
- **Number of Month:** 1
- **Number of Days:** 0

36.1.2 Site Grading Phase Assumptions

- General Site Grading Information
- **Area of Site to be Graded (ft^2):** 28000
- **Amount of Material to be Hauled On-Site (yd^3):** 2075
- **Amount of Material to be Hauled Off-Site (yd^3):** 2075

- Site Grading Default Settings
- **Default Settings Used:** No
- **Average Day(s) worked per week:** 6

- 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

36.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

36.1.4 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

36.2 Trenching/Excavating Phase

36.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

36.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2850
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

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- 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

36.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

36.2.4 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

36.3 Building Construction Phase

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36.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 6
Number of Days: 0

36.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 27983
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	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

36.3.3 Building Construction Phase Emission Factor(s)

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- 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
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
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
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

36.3.4 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

36.4 Architectural Coatings Phase

36.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

36.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential

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Total Square Footage (ft^2): 27983
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

36.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

36.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

37. Construction / Demolition

37.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Generator Building

- Activity Description:
Construct a 450-SF building to house the emergency generator for the Base Operations Facility.

- Activity Start Date
Start Month: 5
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.012351
SO_x	0.000144
NO_x	0.031911
CO	0.067535
PM 10	0.001278

Pollutant	Total Emissions (TONs)
PM 2.5	0.001045
Pb	0.000000
NH_3	0.000179
CO_2e	13.0

37.1 Site Grading Phase

37.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 1

37.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 450
Amount of Material to be Hauled On-Site (yd^3): 33
Amount of Material to be Hauled Off-Site (yd^3): 33

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

37.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

37.1.4 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

37.2 Building Construction Phase

37.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 14

37.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 450
Height of Building (ft): 20
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

37.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

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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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

37.2.4 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

37.3 Architectural Coatings Phase

37.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 3
Start Year: 2029

- Phase Duration
Number of Month: 0
Number of Days: 7

37.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 450
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

37.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

37.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

38. Construction / Demolition

38.1 General Information & Timeline Assumptions

- Activity Location

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Reroute Wake Avenue

- Activity Description:
Reroute Wake Avenue.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.066896
SO_x	0.001027
NO_x	0.302407
CO	0.582588
PM 10	0.914997

Pollutant	Total Emissions (TONs)
PM 2.5	0.013159
Pb	0.000000
NH_3	0.002130
CO_2e	91.4

38.1 Site Grading Phase

38.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

38.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 75520
Amount of Material to be Hauled On-Site (yd^3): 5594
Amount of Material to be Hauled Off-Site (yd^3): 5594

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

38.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

38.1.4 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

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- 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

38.2 Paving Phase

38.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 1
Number of Days: 0

38.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 75520

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
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

38.2.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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)

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	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

38.2.4 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)

39. Construction / Demolition

39.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct North Bravo Parking Apron

- Activity Description:
Construct a 1,100,000-SF apron.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.552584
SO_x	0.008500
NO_x	2.200472
CO	4.843889
PM 10	39.487535

Pollutant	Total Emissions (TONs)
PM 2.5	0.090255
Pb	0.000000
NH_3	0.022664
CO_2e	743.8

39.1 Site Grading Phase

39.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3

Number of Days: 0

39.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 1100000
Amount of Material to be Hauled On-Site (yd^3): 83600
Amount of Material to be Hauled Off-Site (yd^3): 83600

- Site Grading Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	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

39.1.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
Scrapers Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

39.1.4 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

39.2 Paving Phase

39.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

39.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 1100000

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6
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

39.2.3 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	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

39.2.4 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)

40. Construction / Demolition

40.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Dining Facility

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- Activity Description:
Construct a 22,778-SF dining facility in support of the CSF project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.380459
SO_x	0.002103
NO_x	0.569344
CO	1.095453
PM 10	0.292726

Pollutant	Total Emissions (TONs)
PM 2.5	0.019890
Pb	0.000000
NH_3	0.003453
CO_2e	187.5

40.1 Site Grading Phase

40.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

40.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 22778
Amount of Material to be Hauled On-Site (yd^3): 1688
Amount of Material to be Hauled Off-Site (yd^3): 1688

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

40.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

40.1.4 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

40.2 Trenching/Excavating Phase

40.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 1

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40.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 900
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- 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

40.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

40.2.4 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

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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

40.3 Building Construction Phase

40.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

40.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 22778
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	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

40.3.3 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
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
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
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

40.3.4 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

40.4 Architectural Coatings Phase

40.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date

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Start Month: 6
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

40.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 22778
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

40.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

40.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

41. Construction / Demolition

41.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Multi-Purpose Facility

- Activity Description:
Construct a 13,246-SF building to house the billeting office, medical clinic, fitness center, and base laundry facilities in support of the CSF project.

- Activity Start Date
Start Month: 7
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.247294
SO_x	0.001860
NO_x	0.428271
CO	0.847732
PM 10	0.178034

Pollutant	Total Emissions (TONs)
PM 2.5	0.014634
Pb	0.000000
NH_3	0.002149
CO_2e	169.8

41.1 Site Grading Phase

41.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2030

- Phase Duration

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Number of Month: 1
Number of Days: 0

41.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 13246
Amount of Material to be Hauled On-Site (yd^3): 982
Amount of Material to be Hauled Off-Site (yd^3): 982

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

41.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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)

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	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

41.1.4 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

41.2 Trenching/Excavating Phase

41.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 14

41.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 900
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

41.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

41.2.4 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

41.3 Building Construction Phase

41.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 3
Start Year: 2030

- Phase Duration
Number of Month: 4
Number of Days: 0

41.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 13246
Height of Building (ft): 20
Number of Units: N/A

- Building Construction Default Settings

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Default Settings Used: No
Average Day(s) worked per week: 6

- 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

41.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

41.3.4 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

41.4 Architectural Coatings Phase

41.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

41.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 13246
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

41.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

41.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

42. Construction / Demolition

42.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Generator Building

- Activity Description:
Construct a 450-SF building to house the emergency generator in support of the CSF project.

- Activity Start Date
Start Month: 8
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)

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VOC	0.017662
SO_x	0.000241
NO_x	0.060673
CO	0.104476
PM 10	0.003410

PM 2.5	0.002137
Pb	0.000000
NH_3	0.000227
CO_2e	22.5

42.1 Site Grading Phase

42.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 2
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

42.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 450
Amount of Material to be Hauled On-Site (yd^3): 34
Amount of Material to be Hauled Off-Site (yd^3): 34

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

42.1.3 Site Grading Phase Emission Factor(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

42.1.4 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

42.2 Building Construction Phase

42.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 14

42.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 450
Height of Building (ft): 14
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

42.2.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

42.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

42.3 Architectural Coatings Phase

42.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 3
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

42.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 450
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

42.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

42.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

43. Construction / Demolition

43.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Picnic Pavilion #1

- Activity Description:
Construct an 802-SF Picnic Pavilion in support of the CSF project.

- Activity Start Date
Start Month: 12
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.008540
SO_x	0.000146
NO_x	0.040528
CO	0.077946

Pollutant	Total Emissions (TONs)
PM 2.5	0.001630
Pb	0.000000
NH_3	0.000205
CO_2e	13.0

PM 10	0.002028			

43.1 Site Grading Phase

43.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 1

43.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 802
Amount of Material to be Hauled On-Site (yd^3): 60
Amount of Material to be Hauled Off-Site (yd^3): 60

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

43.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

43.1.4 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

43.2 Building Construction Phase

43.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 3
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

43.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Commercial or Retail
Area of Building (ft^2): 802
Height of Building (ft): 14
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

43.2.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

43.2.4 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 * (0.32 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.32 / 1000): Conversion Factor ft^3 to trips (0.32 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 * (0.05 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.05 / 1000): Conversion Factor ft^3 to trips (0.05 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 (%)

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2000: Conversion Factor pounds to tons

43.3 Paving Phase

43.3.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 2
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

43.3.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 802

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
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

43.3.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

43.3.4 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)

44. Construction / Demolition

44.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Picnic Pavilion #2

- Activity Description:
Construct an 802-SF picnic pavilion in support of the CSF project.

- Activity Start Date
Start Month: 12
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.008608
SO_x	0.000146
NO_x	0.040584
CO	0.079051
PM 10	0.002031

Pollutant	Total Emissions (TONs)
PM 2.5	0.001631
Pb	0.000000
NH_3	0.000215
CO_2e	13.1

44.1 Site Grading Phase

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44.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 1

44.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 802
Amount of Material to be Hauled On-Site (yd^3): 60
Amount of Material to be Hauled Off-Site (yd^3): 60

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

44.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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

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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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

44.1.4 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

44.2 Building Construction Phase

44.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 4
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

44.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 802
Height of Building (ft): 14
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

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- 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

44.2.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

44.2.4 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

44.3 Paving Phase

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44.3.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 12
Start Quarter: 3
Start Year: 2030

- Phase Duration

Number of Month: 0
Number of Days: 7

44.3.2 Paving Phase Assumptions

- General Paving Information

Paving Area (ft^2): 802

- Paving Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
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

44.3.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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

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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

44.3.4 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)

45. Construction / Demolition

45.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Short Term Visiting Airman Dorm #1

- Activity Description:
Construct a 17,175-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.026892
SO_x	0.001342
NO_x	0.324189
CO	0.599456
PM 10	0.216998

Pollutant	Total Emissions (TONs)
PM 2.5	0.011208
Pb	0.000000
NH_3	0.001435
CO_2e	123.7

45.1 Site Grading Phase

45.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1

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Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

45.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 17175
Amount of Material to be Hauled On-Site (yd^3): 1273
Amount of Material to be Hauled Off-Site (yd^3): 1273

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

45.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

45.1.4 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

45.2 Trenching/Excavating Phase

45.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 1

45.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1200
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

45.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

45.2.4 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

45.3 Building Construction Phase

45.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

45.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 17175

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Height of Building (ft): N/A
Number of Units: 72

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

45.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

45.3.4 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} = NU * 0.36 * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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} = NU * 0.11 * HT

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)

NU: Number of Units
0.11: Conversion Factor units to trips
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

45.4 Architectural Coatings Phase

45.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

45.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 72

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

45.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

45.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

46. Construction / Demolition

46.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Short Term Visiting Airman Dorm #2

- Activity Description:
Construct a 17,175-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2030

- Activity Emissions:

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Pollutant	Total Emissions (TONs)
VOC	1.050636
SO_x	0.001857
NO_x	0.429042
CO	0.810006
PM 10	0.234449

Pollutant	Total Emissions (TONs)
PM 2.5	0.014846
Pb	0.000000
NH_3	0.001697
CO_2e	171.0

46.1 Site Grading Phase

46.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

46.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 17175
Amount of Material to be Hauled On-Site (yd^3): 1273
Amount of Material to be Hauled Off-Site (yd^3): 1273

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

46.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

46.1.4 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

46.2 Trenching/Excavating Phase

46.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 2
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

46.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1200
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

46.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

46.2.4 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

46.3 Building Construction Phase

46.3.1 Building Construction Phase Timeline Assumptions

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- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

46.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 17175
Height of Building (ft): N/A
Number of Units: 72

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

46.3.3 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

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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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

46.3.4 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} = NU * 0.36 * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

46.4 Architectural Coatings Phase

46.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

46.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 72

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

46.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

46.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

VMT_{WT} = (1 * WT * PA) / 800

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

- Off-Gassing Emissions per Phase

VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

47. Construction / Demolition

47.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Short Term Visiting Airman Dorm #3

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Description:
Construct a 17,175-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.050636
SO_x	0.001857
NO_x	0.429042
CO	0.810006
PM 10	0.234449

Pollutant	Total Emissions (TONs)
PM 2.5	0.014846
Pb	0.000000
NH_3	0.001697
CO_2e	171.0

47.1 Site Grading Phase

47.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

47.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 17175
Amount of Material to be Hauled On-Site (yd^3): 1273
Amount of Material to be Hauled Off-Site (yd^3): 1273

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

47.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

47.1.4 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

47.2 Trenching/Excavating Phase

47.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 3
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

47.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 1200
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- 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

47.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

47.2.4 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

47.3 Building Construction Phase

47.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

47.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 17175
Height of Building (ft): N/A
Number of Units: 72

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

47.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

47.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

47.4 Architectural Coatings Phase

47.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

47.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 72

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

47.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

47.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)

2000: Conversion Factor pounds to tons

48. Construction / Demolition

48.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Long Term Visiting Airman Dorm

- Activity Description:
Construct a 23,015-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 9
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.410593
SO_x	0.002515
NO_x	0.668248
CO	1.187330
PM 10	0.327149

Pollutant	Total Emissions (TONs)
PM 2.5	0.023369
Pb	0.000000
NH_3	0.002628
CO_2e	229.0

48.1 Site Grading Phase

48.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

48.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 23015
Amount of Material to be Hauled On-Site (yd^3): 1705
Amount of Material to be Hauled Off-Site (yd^3): 1705

- Site Grading Default Settings

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Default Settings Used: No
Average Day(s) worked per week: 6

- 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

48.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

48.1.4 Site Grading Phase Formula(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

48.2 Trenching/Excavating Phase

48.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 4
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

48.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

48.2.3 Trenching / Excavating 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	$CO_{2}e$
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

48.2.4 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

48.3 Building Construction Phase

48.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

48.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 23015
Height of Building (ft): N/A
Number of Units: 96

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	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

48.3.3 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
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
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
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

48.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

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
$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

48.4 Architectural Coatings Phase

48.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

48.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 96

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

48.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

48.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

49. Construction / Demolition

49.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Permanent Party Airman Dorm #1

- Activity Description:
Construct a 30,171-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.878630
SO_x	0.002522
NO_x	0.668640
CO	1.195152

Pollutant	Total Emissions (TONs)
PM 2.5	0.023379
Pb	0.000000
NH_3	0.002700
CO_2e	229.3

PM 10	0.398270			

49.1 Site Grading Phase

49.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

49.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30171
Amount of Material to be Hauled On-Site (yd^3): 2235
Amount of Material to be Hauled Off-Site (yd^3): 2235

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

49.1.3 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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

49.1.4 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

49.2 Trenching/Excavating Phase

49.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

49.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 1200
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

49.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

49.2.4 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

49.3 Building Construction Phase

49.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 7
Start Quarter: 1
Start Year: 2030

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 3
Number of Days: 0

49.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 30171
Height of Building (ft): N/A
Number of Units: 56

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	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

49.3.3 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

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Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
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
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

49.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

49.4 Architectural Coatings Phase

49.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

49.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 56

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

49.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

49.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

VMT_{WT} = (1 * WT * PA) / 800

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

- Off-Gassing Emissions per Phase

VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

50. Construction / Demolition

50.1 General Information & Timeline Assumptions

- Activity Location

County: Wake Island

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Permanent Party Airman Dorm #2

- Activity Description:
Construct a 30,171-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.878630
SO_x	0.002522
NO_x	0.668640
CO	1.195152
PM 10	0.412595

Pollutant	Total Emissions (TONs)
PM 2.5	0.023379
Pb	0.000000
NH_3	0.002700
CO_2e	229.3

50.1 Site Grading Phase

50.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

50.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 30171
Amount of Material to be Hauled On-Site (yd^3): 2235
Amount of Material to be Hauled Off-Site (yd^3): 2235

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

50.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

50.1.4 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

50.2 Trenching/Excavating Phase

50.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

50.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

50.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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)

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	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

50.2.4 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

50.3 Building Construction Phase

50.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

50.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 30171
Height of Building (ft): N/A
Number of Units: 56

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	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

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- 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

50.3.3 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
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
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
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

50.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

50.4 Architectural Coatings Phase

50.4.1 Architectural Coatings Phase Timeline Assumptions

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- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

50.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 56

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

50.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

50.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

51. Construction / Demolition

51.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct Unaccompanied NCO Dormitory

- Activity Description:
Construct a 41,762-SF dormitory in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.276861
SO_x	0.002208
NO_x	0.583371
CO	1.052786
PM 10	0.555183

Pollutant	Total Emissions (TONs)
PM 2.5	0.020463
Pb	0.000000
NH_3	0.002519
CO_2e	200.5

51.1 Site Grading Phase

51.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

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- Phase Duration
Number of Month: 1
Number of Days: 0

51.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 41762
Amount of Material to be Hauled On-Site (yd^3): 3094
Amount of Material to be Hauled Off-Site (yd^3): 3094

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

51.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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

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- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

51.1.4 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

51.2 Trenching/Excavating Phase

51.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

51.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 3600
Amount of Material to be Hauled On-Site (yd^3): 0
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 (default)

- Construction Exhaust (default)

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 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- 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 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

51.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

51.2.4 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

51.3 Building Construction Phase

51.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 3
Number of Days: 0

51.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 41762
Height of Building (ft): N/A
Number of Units: 12

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- 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 (default)

- 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 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

51.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

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
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057
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
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

51.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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} = NU * 0.11 * HT

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

51.4 Architectural Coatings Phase

51.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

51.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 12

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

51.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

51.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
VMT_{WT} = (1 * WT * PA) / 800

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

- Off-Gassing Emissions per Phase
VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

52. Construction / Demolition

52.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct DET Staff Duplex #1

- Activity Description:
Construct a 1,180-SF duplex in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 2
Start Month: 2030

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.091721
SO_x	0.001308
NO_x	0.314990
CO	0.535469
PM 10	0.054105

Pollutant	Total Emissions (TONs)
PM 2.5	0.011246
Pb	0.000000
NH_3	0.000835
CO_2e	122.1

52.1 Site Grading Phase

52.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

52.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1180
Amount of Material to be Hauled On-Site (yd^3): 88
Amount of Material to be Hauled Off-Site (yd^3): 88

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

52.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

52.1.4 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

52.2 Trenching/Excavating Phase

52.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

52.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Trenching Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- 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

52.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

52.2.4 Trenching / Excavating Phase Formula(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

52.3 Building Construction Phase

52.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 3
Start Quarter: 1
Start Year: 2030

- Phase Duration

Number of Month: 1
Number of Days: 0

52.3.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Multi-Family
Area of Building (ft^2): 1180
Height of Building (ft): N/A
Number of Units: 2

- Building Construction Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- 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

52.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

52.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

52.4 Architectural Coatings Phase

52.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

52.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 2

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

52.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

52.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

53. Construction / Demolition

53.1 General Information & Timeline Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct DET Staff Duplex #2

- Activity Description:
Construct a 1,180-SF duplex in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 2
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.091721
SO_x	0.001308
NO_x	0.314990
CO	0.535469
PM 10	0.054105

Pollutant	Total Emissions (TONs)
PM 2.5	0.011246
Pb	0.000000
NH_3	0.000835
CO_2e	122.1

53.1 Site Grading Phase

53.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

53.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1180
Amount of Material to be Hauled On-Site (yd^3): 88
Amount of Material to be Hauled Off-Site (yd^3): 88

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

53.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

53.1.4 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

53.2 Trenching/Excavating Phase

53.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

53.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

53.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

53.2.4 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

53.3 Building Construction Phase

53.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

53.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 1180
Height of Building (ft): N/A
Number of Units: 2

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

53.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

53.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips

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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

53.4 Architectural Coatings Phase

53.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2030

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 0
Number of Days: 7

53.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 2

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

53.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

53.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

- Off-Gassing Emissions per Phase

VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

54. Construction / Demolition

54.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct DV Duplex

- Activity Description:
Construct a 1,421-SF duplex in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 2
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.091746
SO_x	0.001308
NO_x	0.315010
CO	0.535881
PM 10	0.056984

Pollutant	Total Emissions (TONs)
PM 2.5	0.011246
Pb	0.000000
NH_3	0.000839
CO_2e	122.1

54.1 Site Grading Phase

54.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

54.1.2 Site Grading Phase Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- General Site Grading Information

Area of Site to be Graded (ft^2): 1421
Amount of Material to be Hauled On-Site (yd^3): 106
Amount of Material to be Hauled Off-Site (yd^3): 106

- Site Grading Default Settings

Default Settings Used: No
Average Day(s) worked per week: 6

- 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

54.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

54.1.4 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

54.2 Trenching/Excavating Phase

54.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

54.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

54.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

54.2.4 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

54.3 Building Construction Phase

54.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

54.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Multi-Family
Area of Building (ft^2): 1421
Height of Building (ft): N/A
Number of Units: 2

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

54.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

54.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.36: Conversion Factor units to trips
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

$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Tips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

54.4 Architectural Coatings Phase

54.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

54.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Multi-Family
Total Square Footage (ft^2): N/A
Number of Units: 2

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

54.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

54.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

- Off-Gassing Emissions per Phase
VOC_{AC} = (NU * 850 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
850: Conversion Factor units to square feet (850 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

55. Construction / Demolition

55.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construct DET CC House

- Activity Description:
Construct a 1,001-SF house in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 2
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.093267
SO_x	0.001307
NO_x	0.314974
CO	0.535146
PM 10	0.051968

Pollutant	Total Emissions (TONs)
PM 2.5	0.011245
Pb	0.000000
NH_3	0.000832
CO_2e	122.1

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55.1 Site Grading Phase

55.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

55.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 1001
Amount of Material to be Hauled On-Site (yd^3): 75
Amount of Material to be Hauled Off-Site (yd^3): 75

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

55.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89

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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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

55.1.4 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

55.2 Trenching/Excavating Phase

55.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

55.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2400
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

55.2.3 Trenching / Excavating 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

55.2.4 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

55.3 Building Construction Phase

55.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1

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Number of Days: 0

55.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Single-Family
Area of Building (ft^2): 1001
Height of Building (ft): N/A
Number of Units: 1

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

55.3.3 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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

55.3.4 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

$VMT_{VE} = NU * 0.36 * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
NU: Number of Units
0.72: Conversion Factor units to trips
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
$VMT_{VT} = NU * 0.11 * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
NU: Number of Units
0.11: Conversion Factor units to trips
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

55.4 Architectural Coatings Phase

55.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 7

55.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Single-Family
Total Square Footage (ft^2): N/A
Number of Units: 1

- Architectural Coatings Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

55.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e

LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

55.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
VMT_{WT} = (1 * WT * PA) / 800

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

- Off-Gassing Emissions per Phase
VOC_{AC} = (NU * 1800 * 2.7 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
NU: Number of Units
1800: Conversion Factor units to square feet (1800 ft^2 / unit)
2.7: Conversion Factor total area to coated area (2.7 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

56. Emergency Generator

56.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Remove B1100 DFAC Emergency Generator

- Activity Description:
Remove 268 BHP Emergency Generator associated with B1104 Dining Facility.

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- Activity Start Date
Start Month: 3
Start Year: 2029

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.011216
SO_x	-0.009447
NO_x	-0.046230
CO	-0.030874
PM 10	-0.010090

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.010090
Pb	0.000000
NH_3	0.000000
CO_2e	-5.3

56.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 268
Average Operating Hours Per Year (hours): 30

56.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

56.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

57. Emergency Generator

57.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

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County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Remove B1503 Passenger Terminal Emergency Generator

- Activity Description:
Remove 331-BHP emergency generator associated with existing passenger terminal/operations facility.

- Activity Start Date
Start Month: 5
Start Year: 2029

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.013852
SO_x	-0.011668
NO_x	-0.057098
CO	-0.038131
PM 10	-0.012462

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.012462
Pb	0.000000
NH_3	0.000000
CO_2e	-6.6

57.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 331
Average Operating Hours Per Year (hours): 30

57.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

57.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

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58. Emergency Generator

58.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Install New Emergency Generator - Base Operations

- Activity Description:
Install new 268-BHP emergency generator to support Consolidated Base Operations Facility.

- Activity Start Date
Start Month: 8
Start Year: 2029

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.011216
SO_x	0.009447
NO_x	0.046230
CO	0.030874
PM 10	0.010090

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.010090
Pb	0.000000
NH_3	0.000000
CO_2e	5.3

58.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 268
Average Operating Hours Per Year (hours): 30

58.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

58.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

59. Emergency Generator

59.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Install New Emergency Generator - Base Support

- Activity Description:
Install a new 331-BHP emergency generator in support of the CSF project.

- Activity Start Date
Start Month: 9
Start Year: 2030

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.013852
SO_x	0.011668
NO_x	0.057098
CO	0.038131
PM 10	0.012462

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.012462
Pb	0.000000
NH_3	0.000000
CO_2e	6.6

59.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: No

- Emergency Generators Consumption
Emergency Generator's Horsepower: 331
Average Operating Hours Per Year (hours): 30

59.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

59.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

60. Construction / Demolition

60.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Base Ops New Pavements

- Activity Description:
Construct 29,490 SF of new pavements (e.g., driveways parking, sidewalks) in support of the Base Operations Facility project.

- Activity Start Date
Start Month: 11
Start Month: 2029

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2029

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.057158
SO_x	0.000913
NO_x	0.280825
CO	0.471550
PM 10	0.364285

Pollutant	Total Emissions (TONs)
PM 2.5	0.012055
Pb	0.000000
NH_3	0.001303
CO_2e	83.5

60.1 Site Grading Phase

60.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1

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Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

60.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 29490
Amount of Material to be Hauled On-Site (yd^3): 2185
Amount of Material to be Hauled Off-Site (yd^3): 2185

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

60.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

60.1.4 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

60.2 Paving Phase

60.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2029

- Phase Duration
Number of Month: 1
Number of Days: 0

60.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 29490

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

60.2.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

60.2.4 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)

61. Construction / Demolition

61.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: CSF New Pavements

- Activity Description:
Construct 15,837 SF of new pavements in support of the CSF project.

- Activity Start Date
Start Month: 11
Start Month: 2030

- Activity End Date
Indefinite: False

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End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.049106
SO_x	0.000812
NO_x	0.245109
CO	0.398030
PM 10	0.199250

Pollutant	Total Emissions (TONs)
PM 2.5	0.010046
Pb	0.000000
NH_3	0.001010
CO_2e	74.8

61.1 Site Grading Phase

61.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

61.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 15837
Amount of Material to be Hauled On-Site (yd^3): 1174
Amount of Material to be Hauled Off-Site (yd^3): 1174

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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 (%)

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	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

61.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

61.1.4 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

61.2 Paving Phase

61.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

61.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 15837

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

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- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
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

61.2.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

61.2.4 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)

62. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

62.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: BLQ New Pavements

- Activity Description:
Construct 102,000 SF of new pavements in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 11
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.070601
SO_x	0.001069
NO_x	0.304796
CO	0.630245
PM 10	1.231233

Pollutant	Total Emissions (TONs)
PM 2.5	0.013224
Pb	0.000000
NH_3	0.002567
CO_2e	93.7

62.1 Site Grading Phase

62.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

62.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 102000
Amount of Material to be Hauled On-Site (yd^3): 7555
Amount of Material to be Hauled Off-Site (yd^3): 7555

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- 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

62.1.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

62.1.4 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

62.2 Paving Phase

62.2.1 Paving Phase Timeline Assumptions

- Phase Start Date

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Start Month: 12
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

62.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 102000

- Paving Default Settings
Default Settings Used: No
Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
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

62.2.3 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	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

62.2.4 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)

63. Construction / Demolition

63.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B506

- Activity Description:
Demolish a 2,155-SF VOQ building in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006143
SO_x	0.000109
NO_x	0.032638
CO	0.065863
PM 10	0.010215

Pollutant	Total Emissions (TONs)
PM 2.5	0.001139
Pb	0.000000
NH_3	0.000167
CO_2e	9.9

63.1 Demolition Phase

63.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2030

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- Phase Duration
Number of Month: 0
Number of Days: 14

63.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2155
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

63.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

63.1.4 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

64. Construction / Demolition

64.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B626, Officers Quarters CES/CC

- Activity Description:
Demolish B626 3,063-SF Officers Quarters CES/CC facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 2
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013103
SO_x	0.000234
NO_x	0.070544
CO	0.139301
PM 10	0.015378

Pollutant	Total Emissions (TONs)
PM 2.5	0.002464
Pb	0.000000
NH_3	0.000332
CO_2e	21.4

64.1 Demolition Phase

64.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 2
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

64.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 3063
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

64.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

64.1.4 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

65. Construction / Demolition

65.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B921 Dormitory Airman Permanent

- Activity Description:
Demolish B921 3,429-SF Dormitory Airman Permanent facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 3
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 3
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013594
SO_x	0.000241
NO_x	0.070947
CO	0.147338
PM 10	0.031338

Pollutant	Total Emissions (TONs)
PM 2.5	0.002475
Pb	0.000000
NH_3	0.000405
CO_2e	21.8

65.1 Demolition Phase

65.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

65.1.2 Demolition Phase Assumptions

- General Demolition Information

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Area of Building to be demolished (ft^2): 3429
Height of Building to be demolished (ft): 40

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

65.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

65.1.4 Demolition Phase Formula(s)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

66. Construction / Demolition

66.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B944 Officers Quarters

- Activity Description:
Demolish B944 3,185-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 4
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013119
SO_x	0.000234
NO_x	0.070557
CO	0.139559
PM 10	0.015891

Pollutant	Total Emissions (TONs)
PM 2.5	0.002465
Pb	0.000000
NH_3	0.000334
CO_2e	21.4

66.1 Demolition Phase

66.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

66.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 3185
Height of Building to be demolished (ft): 20

- Default Settings Used: No

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

66.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

66.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

67. Construction / Demolition

67.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1009 Officers Quarters Station Manager

- Activity Description:
Demolish B1009 2,295-SF Officers Quarters Station Manager facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 1
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006161
SO_x	0.000110
NO_x	0.032652
CO	0.066159
PM 10	0.010804

Pollutant	Total Emissions (TONs)
PM 2.5	0.001140
Pb	0.000000
NH_3	0.000170
CO_2e	10.0

67.1 Demolition Phase

67.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 2
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 14

67.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2295
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

67.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

67.1.4 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

68. Construction / Demolition

68.1 General Information & Timeline Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1010 Officers Quarters

- Activity Description:
Demolish B1010 2,295-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 5
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013004
SO_x	0.000233
NO_x	0.070463
CO	0.137674
PM 10	0.012148

Pollutant	Total Emissions (TONs)
PM 2.5	0.002462
Pb	0.000000
NH_3	0.000317
CO_2e	21.3

68.1 Demolition Phase

68.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

68.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2295
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

68.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

68.1.4 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

69. Construction / Demolition

69.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: Demo B1011 Officers Quarters

- Activity Description:
Demolish B1011 2,295-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 6
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 6
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013004
SO_x	0.000233
NO_x	0.070463
CO	0.137674
PM 10	0.012148

Pollutant	Total Emissions (TONs)
PM 2.5	0.002462
Pb	0.000000
NH_3	0.000317
CO_2e	21.3

69.1 Demolition Phase

69.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

69.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2295
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 20

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

69.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

69.1.4 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

70. Construction / Demolition

70.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1012 Officers Quarters

- Activity Description:
Demolish B1012 2,147-SF Officers Quarters facility in support of the Base Living Quarters project.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Start Date
Start Month: 7
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006142
SO_x	0.000109
NO_x	0.032637
CO	0.065846
PM 10	0.010182

Pollutant	Total Emissions (TONs)
PM 2.5	0.001139
Pb	0.000000
NH_3	0.000167
CO_2e	9.9

70.1 Demolition Phase

70.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 14

70.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2147
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

70.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

70.1.4 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

71. Construction / Demolition

71.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1013 Officers Quarters

- Activity Description:
Demolish B1013 2,335-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 7
Start Month: 2030

- Activity End Date
Indefinite: False

End Month: 7
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006167
SO_x	0.000110
NO_x	0.032657
CO	0.066244
PM 10	0.010972

Pollutant	Total Emissions (TONs)
PM 2.5	0.001140
Pb	0.000000
NH_3	0.000171
CO_2e	10.0

71.1 Demolition Phase

71.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 2
Start Year: 2030

- Phase Duration
Number of Month: 0
Number of Days: 14

71.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2335
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

71.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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**
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

71.1.4 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

72. Construction / Demolition

72.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1014 Officers Quarters

- Activity Description:
Demolish B1014 2,148-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 8
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)

VOC	0.012985		PM 2.5	0.002462
SO_x	0.000233		Pb	0.000000
NO_x	0.070447		NH_3	0.000314
CO	0.137363		CO_2e	21.3
PM 10	0.011530			

72.1 Demolition Phase

72.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

72.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2148
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

72.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

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Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

72.1.4 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

73. Construction / Demolition

73.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1015 Officers Quarters

- Activity Description:
Demolish B1015 2,268-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 9
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 9
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013000
SO_x	0.000233
NO_x	0.070460
CO	0.137617

Pollutant	Total Emissions (TONs)
PM 2.5	0.002462
Pb	0.000000
NH_3	0.000316
CO_2e	21.3

PM 10	0.012034			

73.1 Demolition Phase

73.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

73.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2268
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

73.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

73.1.4 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

74. Construction / Demolition

74.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1016 Officers Quarters

- Activity Description:
Demolish B1016 2,295-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 10
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013004
SO_x	0.000233
NO_x	0.070463
CO	0.137674
PM 10	0.012148

Pollutant	Total Emissions (TONs)
PM 2.5	0.002462
Pb	0.000000
NH_3	0.000317
CO_2e	21.3

74.1 Demolition Phase

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74.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

74.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2295
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

74.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

74.1.4 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

75. Construction / Demolition

75.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1017 Officers Quarters

- Activity Description:
Demolish B1017 2,980-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 11
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)	Pollutant	Total Emissions (TONs)
VOC	0.013092	PM 2.5	0.002464
SO_x	0.000234	Pb	0.000000
NO_x	0.070535	NH_3	0.000330
CO	0.139125	CO_2e	21.4
PM 10	0.015029		

75.1 Demolition Phase

75.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 11

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Start Quarter: 1
Start Year: 2030

- Phase Duration
Number of Month: 1
Number of Days: 0

75.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2980
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

75.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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

LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

75.1.4 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

76. Construction / Demolition

76.1 General Information & Timeline Assumptions

- Activity Location
County: Wake Island
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Demo B1018 Officers Quarters

- Activity Description:
Demolish B1018 2,980-SF Officers Quarters facility in support of the Base Living Quarters project.

- Activity Start Date
Start Month: 12
Start Month: 2030

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2030

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013092
SO_x	0.000234
NO_x	0.070535
CO	0.139125
PM 10	0.015029

Pollutant	Total Emissions (TONs)
PM 2.5	0.002464
Pb	0.000000
NH_3	0.000330
CO_2e	21.4

76.1 Demolition Phase

76.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 1
Start Year: 2030

- Phase Duration

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Number of Month: 1
Number of Days: 0

76.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 2980
Height of Building to be demolished (ft): 20

- Default Settings Used: No

- Average Day(s) worked per week: 6

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws 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): 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

76.1.3 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	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
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
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
LDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDGT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDGV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
LDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

LDDT	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
HDDV	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800
MC	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

76.1.4 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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

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

APPENDIX C

PRELIMINARY JURISDICTIONAL DETERMINATION REPORT

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Preliminary Jurisdictional Determination Report

Wake Island Airfield, Wake Atoll

9 August 2023

Prepared for:

Brice Environmental Services Corporation
3700 Centerpoint West, Suite 8133
Anchorage, AK 99503

Prepared by:

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Prepared by ______________________________
Alivia Lowell

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Zach Baer, PWS

Approved by ______________________________
Steve Reidsma, PWS

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Executive Summary

This 2023 Preliminary Jurisdictional Determination Report presents the findings of the baseline (current existing conditions) extent of wetlands and waters and vegetation cover within the Wake Island Airfield project study area for Brice Environmental Services Corporation. The study area totals 1,190.1 acres.

The 2023 study area wetland mapping is based on the criteria in the U.S. Army Corps of Engineers Wetland Delineation Manual (USACE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai'i and Pacific Islands (Version 2.0) (USACE 2012), and the 2020 National Wetland Plant List (USACE 2020b).

The results of the field verified mapping shows Marine Waters (i.e., ocean and lagoon) account for 292.0 acres (24.5 percent) of the study area, ponds account for 7.6 acres (0.6 percent) of the study area, and wetlands account for 16.8 acres (1.4 percent) of the study area.

Project Study Area: Waters of the U.S. Determination

Status	Acres	Percent of Study Area
Palustrine Wetlands	16.8	1.4
Palustrine Waters (Ponds)	7.6	0.6
Marine Waters	292.0	24.5
Total Wetlands and Waters	**316.4**	**26.6**
Uplands	**873.7**	**73.4**
Total Study Area	**1,190.1**	**100.0**

The majority of the study area was found to be uplands. Seven ponds and associated fringe wetlands are the only waters not associated directly with the lagoon shoreline. The oceanside of the island has no wetlands, only shoreline.

The dominant Cowardin wetland classifications (Cowardin et al. 1979) was Deciduous Shrub. Ponds and Marine waters were also present.

Abbreviations

2012 Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai'i and Pacific Islands Region (Version 2.0)
FVP	Field Verification Point
GPS	Global Positioning System
INRMP	Integrated Natural Resources Management Plan
Stantec	Stantec Consulting Services Inc.
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WD	Wetland Determination Point

1.0 INTRODUCTION

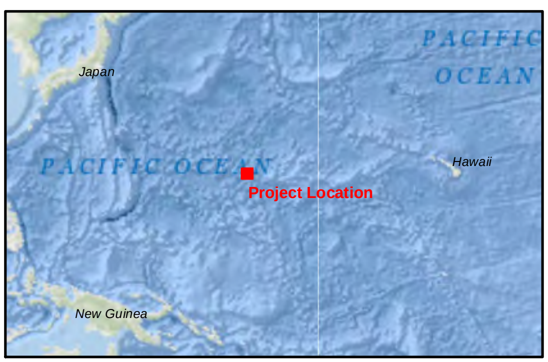
The U.S. Air Force (USAF) proposes facility upgrades at Wake Island Airfield, on Wake Island in the Pacific Ocean. Stantec Consulting Services Inc. (Stantec), subcontracted through Brice Environmental Services Corporation, has determined the baseline status of wetlands, waters, and vegetation for the 1,190.1-acre Wake Island project study area (study area).

This Preliminary Jurisdictional Determination Report provides the baseline data necessary to determine the total Waters of the U.S. within the study area.

The team collected field data including wetland determinations in March 2023. The results were mapped in accordance with the United States Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai'i and Pacific Islands Region (Version 2.0) (2012 Supplement, USACE 2012). There is no specific report guidance listed for the Honolulu USACE District, therefore this Report meets the guidelines set forth in Special Public Notice 2020-00399 (USACE 2020a), Consultant Supplied Jurisdictional Determination Reports in Alaska.

1.1 STUDY AREA LOCATION

The study area is located at Wake Island, which is one of three islands that make up Wake Atoll in the Pacific Ocean (Figure 1). Wake Island is approximately 2,300 miles southwest of Honolulu, Hawai'i, and 1,600 miles east of Guam. The two other islands of Wake Atoll, Peale and Wilkes, are uninhabited. The centroid study area is located at latitude 19.2801° N, longitude 166.6474 ° E.



Study Area

0 0.5 1 Miles

(At original document size of 8.5x11)
1:63,360 1 in = 1 miles

N
W E
S

Client
Brice Environmental Services Corporation

Project
Wake Island Airfield Wetland Delineation

Figure
Project Location

Figure Number
1

2.0 EXISTING DATA AND METHODOLOGY

2.1 EXISTING DATA

Sources of existing data used in developing baseline environmental data are limited due to the remote nature of the project location and lack of historical environmental studies on Wake Island.

Sources of existing data include: an Environmental Assessment completed in September 2022 (USAF 2022), an Integrated Natural Resources Management Plan (INRMP) completed in 2017 (USAF 2017) and local climate data.

2.1.1 Wetland Data

There is no National Wetland Inventory data for Wake Island (USFWS 2023a).

USAF documents show a wetland delineation was conducted in 2007 by Hebshi and Patrick at Wake Atoll (USAF 2017, 2022). The delineation took place prior to the publication of the 2012 Regional Supplement for Hawai'i and Pacific Islands Region (USACE 2012) and was conducted using the criteria of the 1987 Wetland Delineation Manual (USACE 1987). The 2007 wetland delineation found 58 acres of brackish water wetlands throughout Wake Atoll. These wetlands were dominated by Gagie (*Pemphis* sp.) along the shorelines with varying sized mats of Shoreline Sea-Purslane (*Sesuvium portulacastrum)*.

2.1.2 Vegetation Data

Island biogeography and plant ecology are discussed in the Integrated Natural Resources Management Plan (INRMP, USAF 2017). Descriptions of plants and plant communities on Wake Island are described in an Atoll Research Bulletin (Fosberg and Sachet 1969) and the 2017 INRMP (USAF 2017). The 2017 INRMP categorized dominant plants and vegetation types on Wake Island. Three naturally occurring dominant plant associations were identified: Velvet-Leaf Soldierbush (*Tournefortia argentea*) occurring on coral rubble and shell substrates, Kou (*Cordia subcordata*) found in more mesic conditions, and Gagie (*Pemphis acidula)* found on saturated sandy substrates. Other common dominant vegetative communities include the invasive Ironwood (*Casuarina equisetifolia)* (USAF 2022), ruderal (shrub, herb regrowth on disturbance areas), and maintained/mowed (USAF 2017). Each of the dominant plant associations are further described in the INRMP (USAF 2017).

2.1.3 Soil Data

There are no soil surveys for Wake Island and detailed soil information is not available (Soil Survey Staff 2022). The INRMP (USAF 2017) provides basic soil information, concluding that soil quality on the island is low and lacking many of the nutrients required to support diverse plant communities. Wake Island soils are almost exclusively composed of coarse-grained calcium carbonate (sand). Rapid drainage of the porous coral sand prevents the development of complex soils and organic matter (USAF 2022). Coral sands have characteristically high pH with low iron concentrations. As a result, redox concentrations may not be reliable hydric soil indicators under these conditions (USACE 2012).

2.1.4 Climate Data

The growing season for this area is year-round (USACE 2012).

Climate at Wake Atoll is maritime and controlled by easterly trade winds that dominate the island throughout the year. Average annual wind speed is 13.8 miles per hour. With minimal topographic relief, there is little opportunity for the development of microclimatic conditions. High temperatures and limited rainfall keep the island in a perpetual state of drought. An average annual rainfall of 35 inches provides little drought relief (USAF 2022).

The weather conditions preceding the field investigations were considered during onsite determinations.

2.1.5 Threatened and Endangered Species

There are no federally listed terrestrial plant or animal species or critical habitats within the study area on Wake Atoll (USAF 2017). Federally protected terrestrial biota within the study area are limited to migratory seabirds and shorebirds (USAF 2022).

2.2 METHODOLOGY

This section provides the methodology used during field data collection and digital mapping.

2.2.1 Field Data Collection

During the 2023 wetland field evaluations, Global Positioning System (GPS) locations and detailed information on plots (1/10) were recorded in representative project vegetation types. Additional field data, notes, and photographs were used to evaluate mapping areas with similar characteristics.

Field data was collected and recorded using three types of plots:

Wetland Determination (WD) Plots. At these sites, investigators recorded detailed descriptions of vegetation, hydrology, and soils on field data forms. Wetland status for this plot type was determined based on the presence or absence of hydrophytic vegetation, hydrology, and hydric soils (USACE 2012).

Field Verification Points (FVP). Photographs and GPS locations were taken for vegetation communities and landscape positions that were clearly wetland, water, or upland. If a wetland or water, Cowardin classifications were recorded.

Waterbody (WB) Points. Photographs and GPS locations were taken when ponds or shorelines were sampled.

Plant Data

The Hawai'i and Pacific Islands 2020 Regional Plant list is divided into two subregions: Hawai'i, and Pacific Islands. Plant indicator status may vary between subregions. The Pacific Islands subregion specifically includes the Territories of Guam and American Samoa, as well as the Commonwealth of the Northern Mariana Islands. Wake Atoll is not included in either subregion; the Pacific Islands subregion was used for determining plant indictor status if listed, otherwise the Hawai'i subregion was used.

Plant indicator statuses are listed in Appendix A. Plants were identified to the taxonomic level of species.

The presence or absence of hydrophytic vegetation was determined using the prevalence index and the dominance test (USACE 2012).

Hydric Soils Assessment

Field indicators of hydric soils and determination of hydric soil status was based on USDA National Resource Conservation Service (NRCS) guidance (USDA 2018) and the 2012 Supplement (USACE 2012). The 2012 Supplement contains a subset of hydric soil indicators found in the U.S. as determined by the National Technical Committee for Hydric Soils (USACE 2012). Additional soil characteristics recorded within the soil horizons were based on NRCS guidance (Schoeneberger et al. 2012).

Hydrology

The 2012 Supplement lists numerous primary and secondary hydrology indicators. All indicators found in each WD sampling area were recorded in the data form.

Field Data

Field data were collected at 157 sites throughout the study area, using an Eos Arrow 100 sub-meter accuracy GPS receiver. All field data were entered into a project database where the data were reviewed; queries were generated from the database to provide the information needed for mapping and results analyses.

Field data was collected March 9-24, 2023, by Professional Wetland Scientist Steve Reidsma. Field plot types collected are shown in Table 1. Each field plot with photos is presented in Appendix B.

Table 1 Field Data Contributing to this Project

Field Plot Type	Wetlands and Waters	Uplands	Total Plots
Wetland Determination (WD)	0	7	7
Field Verification Point (FVP)	3	118	121
Waterbody (WB)	29	0	29
Total	**32**	**125**	**157**

2.2.2 Wetland Mapping

Final mapping (waters boundaries, Cowardin classification) was completed in Esri's ArcMap (10.8) environment using USAF provided aerial imagery.

Field data were used to identify the characteristics of wetlands or waters at a specific location. In addition to imagery interpretations, ancillary data including field notes, general landscape position, slope, and aspect were utilized in the mapping process.

Mapping polygons were drawn to delineate differences among the classification systems used to attribute wetlands and waters polygons. Delineation occurred at a scale of 1:600 (one-inch equals 50 feet).

3.0 RESULTS

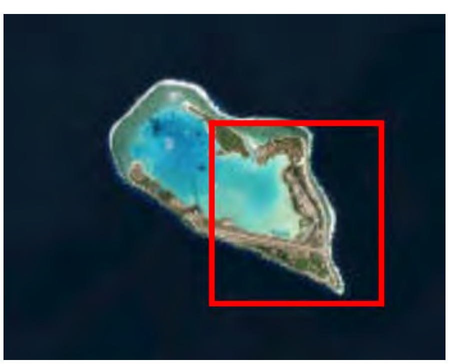
3.1 WETLANDS AND WATERS

The study area covers the northern fork of Wake Island (Figure 1). The study area soils consist of well drained coral sands, gravels, and cobbles. Three ponds (Ponds 1,2,7; see detailed wetland figure in Appendix C) within the study area have their origins in excavations; one is a retention pond near the airfield (Pond 7). A larger pond system, also near the airfield was likely created by building a levee through the lagoon. This pond system includes four depressions (Ponds 3-6) linked by culverts to the lagoon. Minor wetland fringe is found at the latter sites. The lagoon shorelines and bays are lined with Gagie; along with wetland islets that are above water during low tide.

The field verified wetlands and waters totals are summarized in Table 2. Wetlands make up 1.4 percent (16.8 acres) of the study area and are found on small islands and lining various inlets within the lagoon and also located between two of the marine influenced depressional ponds (Ponds 3 and 4). Waters make up 25.2 percent of the study area and are predominately marine (292.0 acres, 24.5 percent of the study area). Seven ponds were found in the study area, comprising 7.6 acres (0.6 percent of the study area). Figure 2 shows an overview of the wetlands and waters in the study area, and Appendix C contains detail figures of the wetlands and waters in the study area.

Table 2 Wetlands and Waters Within the Study Area

Status	Acres	Percent of Study Area
Palustrine Wetlands	16.8	1.4
Total Wetlands	**16.8**	**1.4**
Palustrine Waters (Ponds)	7.6	0.6
Marine Waters	292.0	24.5
Total Waters	**299.6**	**25.2**
Total Wetlands and Waters	**316.4**	**26.6**
Uplands	**873.7**	**73.4**
Total Study Area	**1,190.1**	**100.0**



Study Area
Wetland
Pond
Marine Water

0 1,000 2,000 Feet
(At original document size of 8.5x11)
1:24,000 1 in = 2,000 feet

N W E S

Client
Brice Environmental Services Corporation

Project
Wake Island Airfield Wetland Delineation

Figure
Wetlands and Waters Overview

Figure Number
2

3.1.1 Cowardin Classification

As part of the wetlands mapping, vegetation communities were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Cowardin classifications are shown in Table 3 and labeled on Figure 3.

All wetlands within the study area were classified as Deciduous Shrub, totaling 16.8 acres (1.4 percent of the study area). Waters included marine and pond systems.

Table 3 Cowardin Classifications for the Study Area

Cowardin Type	NWI Code	Acres	Percent of Study Area
Deciduous Shrub Wetland	PSS1	16.8	1.4
	Total Wetlands	**16.8**	**1.4**
Palustrine Pond	PUB	7.6	0.6
Marine Intertidal	M2	289.1	24.3
	M2AB	2.9	0.2
	Total Waters	**299.6**	**25.2**
	Total Wetlands and Waters	**316.4**	**26.6**
	Total Uplands	**873.7**	**73.4**
	Total Study Area	**1,190.1**	**100.0**

3.1.2 Streams

No streams were identified within the study area.

3.1.3 Jurisdiction

Ponds 1-6 are connected to the lagoon by culverts or overbank flooding (Pond 1). Each is inundated by the tide either daily, or during the higher tides. All but Pond 5 support fish species. These ponds are connected by culvert to the lagoon, part of the Pacific Ocean, a Traditional Navigable Water subject to the ebb and flow of the tide.

Pond 7 is a detention pond created between the USAF runway and taxiway. The pond is perched higher than the typical tidal range. Water is received during King tides when the runway is inundated and runoff during precipitation. A culvert flows downward to the lagoon. During normal high tide water does not flow back to the pond.

The USACE Honolulu District issued an Approved Jurisdictional Determination (POH-2021-00086) stating the detention pond is a non-tidal, man-made feature that lacks a surface connection to a navigable water and therefore is not a Water of the U.S. and not subject to USACE jurisdiction (USAF 2017).

Jurisdiction is ultimately determined by USACE.

3.2 VEGETATION

The project vegetation types are listed in Table 4 and shown in Figure 5. The plant community descriptions provided in the 2017 INRMP (USAF 2017) formed the basis for the Project Vegetation Types.

The dominant vegetation group within the study area included open water around the island and the roads/facilities on the island. Land cover vegetation groups are used in areas that lack vegetation in order to create a complete narrative of the cover composition within a study area. The land cover group Open Water (OW) occupied 25.2 percent of the study area and Barren (BARE) areas that had been cleared or are otherwise devoid of vegetation occupied 18.7 percent of the study area.

Forested plant communities dominated the vegetated study area (28.1 percent of the study area), with Tournefortia Forest (Photo 1) and Casuarina (Ironwood) Forest (Photo 2) the most prominent forest types (14.1 and 12.8 percent of the study area, respectively). Tournefortia was found mostly along the outer coastal zone and scattered on the island. Ironwood is an invasive species that covers much of the interior of the island. The ironwood shades the forest floor and provides a thick needle mat on the surface that inhibits understory growth. Shrub plant communities were the second largest vegetation group (17.8 percent of the study area), with ruderal shrub (shrub and herb regrowth on disturbance areas), comprising 11.7 percent of the study area. Mowed vegetation was the only herbaceous vegetation type found within the study area, comprising 10.2 percent of the study area.

Vegetation mapping is summarized in Table 5 and shown in Appendix D.

Photo 1: Tournefortia Community along the Coastline

Photo 2: Ironwood Forest

Table 4 Vegetation Classification Mapping

Vegetation Group	Vegetation Type	Vegetation Code	Total Acres	Percent Study Area
Forested	Casuarina Forest	Cas-F	152.6	12.8
	Coconut Forest	Coc-F	0.2	<0.1
	Cordia Forest	Cor-F	12.8	1.1
	Tournefortia Forest	Tou-F	167.7	14.1
	Misc. Trees	SG-FS	1.3	0.1
		Total Forest	**334.6**	**28.1**
Scrub/Shrub	Ruderal	Ruderal	136.7	11.5
	Tangantangan Shrub	Tan-S	0.1	<0.1
	Scaevola Shrub	Sca-S	26.1	2.2
	Pemphis Shrub	Pem-S	49.5	4.2
		Total Scrub/Shrub	**212.4**	**17.8**
Herbaceous	Mowed/Maintained	Mowed	121.5	10.2
		Total Herbaceous	**121.5**	**10.2**
Land Cover	Bare/Cleared	BARE	222.0	18.7
	Open Water	OW	299.6	25.2
		Total Land Cover	**521.6**	**43.9**
		Total Study Area	**1,190.1**	**100.0**

*Apparent inconsistencies in sums are the results of rounding

Plant Species

Thirty-two vascular plant species are included in the project plant list (Appendix A) and represent the species recorded at WD plots and opportunistically at other plot type locations.

None of the species recorded in the study area are considered threatened or endangered (USFWS 2023b).

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APPENDICES

Appendix A PLANT LIST

Plants recorded during Stantec field work in March 2023 are presented in the table.

Indicator status abbreviations are as follows:

- FACW: Facultative Wetland Plants (Usually occur in wetlands, but may occur in non-wetlands)
- FAC: Facultative Plants (Occur in wetlands and non-wetlands)
- FACU: Facultative Upland Plants (Usually occur in non-wetlands, but may occur in uplands)
- UPL: Upland Plants (Almost always occur in non-wetlands)
- NL: Not listed in the National Wetland Plant List (Assigned a status of UPL)

Latin name, common name, and indicator status rating are from the National Wetland Plant List (USACE 2020b).

Latin Name	Common Name	Indicator Status Rating
Vine		
Ipomoea pes-caprae	Beach Morning Glory	FACU
Tree		
Casuarina equisetifolia	Ironwood	FAC
Coccoloba uvifera	Sea Grape	FACU
Cocos nucifera	Coconut	FACU
Cordia subcordata	Kou	UPL
Terminalia catappa	Indian Almond	FACW
Tournefortia argentea	Velvet-Leaf Soldierbush	FACU
Shrub/Sapling		
Agave sisalana	Sisal	FACU
Bidens pilosa	Spanish Needle	FACU
Bougainvillea spectabilis	Bougainvillea	NL
Euphorbia cyanthophora	Fire on the Mountain	FACU
Euphorbia hirta	Hairy Spurge	FACU
Euphorbia hypericifolia	Graceful Sandmat	FACU
Gossypium hirsutum	Upland Cotton	UPL
Gynandropsis gynandra	Wild Spider Flower	UPL
Heliotropium anomalum	Polynesian Heliotrope	FACU
Leucaena leucocephala	Koa Haole/White Leadtree	UPL
Opuntia spp.	Prickly Pear	NL
Pemphis acidula	Gagie	FAC
Pluchea carolinensis	Sour Bush	FAC
Scaevola sericea	Naupaka	FACU

PLANT LIST

Shrub/Sapling		
Sesuvium portulacastrum	Shoreline Sea-Purslane	FAC
Sida fallax	Ilima	NL
Stachytarpheta jamaicensis	Jamaica Vervain/Blue Flower	FAC
Tribulus cistoides	Puncture Vine/Jamaican Feverplant	UPL
Waltheria indica	Baora-Prieta	FACU
Herbaceous		
Cenchris echinatus	Southern Sandburr	FACU
Erigeron canadensis	Canadian Horseweed	UPL
Eustachys petraea	Pinewoods Finger Grass	FACU
Fimbristylis cymose	Cymose Fimbry	FAC
Heliotropium procumbens	Fourspike Heliotrope	FAC
Portulaca oleracea	Little Hogweed/Purslane	FACU

Appendix B FIELD DATA FORMS AND PHOTOS

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Preliminary Jurisdictional Determination Report

Wake Island Airfield, Wake Atoll

Appendix B

7 August 2023

Prepared for:

Brice Environmental Services Corporation
3700 Centerpoint West, Suite 8133
Anchorage, AK 99503

Prepared by:

Stantec Consulting Services, Inc. 725 East
Fireweed Lane Suite 200 Anchorage,
Alaska 99503

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PHOTO REPORT

Plot Number	ST100
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3078138299
Longitude (DD)	166.642559445

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST101
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3081973121
Longitude (DD)	166.643302477

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST102
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3093572198
Longitude (DD)	166.643638067

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST103
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2945015703
Longitude (DD)	166.644709816

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST104
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2846682741
Longitude (DD)	166.652231194

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST105
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2844956302
Longitude (DD)	166.652481488

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST106
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Scaevola shrub
Latitude (DD)	19.2823855109
Longitude (DD)	166.652812973

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST107
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.3061317467
Longitude (DD)	166.637872457

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST108
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/10/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.3060035874
Longitude (DD)	166.638885196

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST109
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3087199948
Longitude (DD)	166.642369578

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST110
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2895101405
Longitude (DD)	166.647349894

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST111
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2856905573
Longitude (DD)	166.651962596

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST112
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Bare/Cleared
Latitude (DD)	19.2867548848
Longitude (DD)	166.652080597

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST113
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2865640251
Longitude (DD)	166.652521975

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST114
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Scaevola shrub
Latitude (DD)	19.2816156747
Longitude (DD)	166.652904517

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST115
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2866370191
Longitude (DD)	166.653057336

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST116
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.3032201373
Longitude (DD)	166.645093229

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST117
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.3026658304
Longitude (DD)	166.64620276

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST118
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/11/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.309518016
Longitude (DD)	166.643323998

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST119
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2907459581
Longitude (DD)	166.652385534

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST120
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.283103249
Longitude (DD)	166.652297031

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST121
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/11/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2813211778
Longitude (DD)	166.65197316

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST122
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.3067877706
Longitude (DD)	166.63712684

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST123
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Scaevola shrub
Latitude (DD)	19.2846490918
Longitude (DD)	166.653014429

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST124
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/12/2023
NWI Classification	M2USP
Vegetation Type	Bare/Cleared
Latitude (DD)	19.2848108696
Longitude (DD)	166.653360812

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST125
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2881488035
Longitude (DD)	166.652435808

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST126
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/12/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2920566183
Longitude (DD)	166.652100469

Photo Type: Hydrology Direction: NE

Photo Type: Hydrology Direction: NW

Photo Type: Hydrology Direction: SE

PHOTO REPORT

Plot Number	ST127
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2907242677
Longitude (DD)	166.651202447

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST128
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2944492599
Longitude (DD)	166.645548154

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST129
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2989480173
Longitude (DD)	166.643927912

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST130
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/12/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3019024245
Longitude (DD)	166.646933709

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST131
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/12/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3019532047
Longitude (DD)	166.64781765

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST132
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Coconut forest
Latitude (DD)	19.3032296031
Longitude (DD)	166.634614385

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST133
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/13/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3031677788
Longitude (DD)	166.63761087

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST134
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3061998657
Longitude (DD)	166.640251132

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST135
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3050945147
Longitude (DD)	166.643529384

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST136
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3006911187
Longitude (DD)	166.643005061

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST137
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.300529449
Longitude (DD)	166.642038886

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST138
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2780503324
Longitude (DD)	166.653042987

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST139
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/13/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2787699754
Longitude (DD)	166.652819304

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 3/14/23 Time: ______

Applicant/Owner: USAF State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 141

Investigator(s): Steve Reidsma TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): coral atoll Local relief (concave, convex, none): flat

Lat: N 19. 28974 Long: E 166. 65201 Datum: NAD83 Slope (%): 0

Soil Map Unit Name: coral NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? Yes ___ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1/10 acre)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Cas equ - ironwood	85	Y	FAC
3.			
4.			
5.			
= Total Cover			

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

no understory

SOIL

Sampling Point: ST 140

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
1-0	Oi							
0-12	10YR 5/4	100					SA	Coral gravel-cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- N Histosol (A1)
- N Histic Epipedon (A2)
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Muck Presence (A8)
- N Depleted Below Dark Surface (A11)
- N Thick Dark Surface (A12)
- N Sandy Gleyed Matrix (S4)
- N Sandy Redox (S5)
- N Dark Surface (S7)
- N Loamy Gleyed Matrix (F2)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- N Stratified Layers (A5)
- N Sandy Mucky Mineral (S1)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: Coral - hard packed
Depth (inches): beyond 12

Hydric Soil Present? Yes ______ No X

Remarks:
thick leaf litter

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Inundation Visible on Aerial Imagery (B7)
- N Water-Stained Leaves (B9)
- N Aquatic Fauna (B13)
- N Tilapia Nests (B17)
- N Hydrogen Sulfide Odor (C1)
- N Oxidized Rhizospheres on Living Roots (C3)
- N Presence of Reduced Iron (C4)
- N Recent Iron Reduction in Tilled Soils (C6)
- N Thin Muck Surface (C7)
- N Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- N Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- N Surface Soil Cracks (B6)
- N Sparsely Vegetated Concave Surface (B8)
- N Drainage Patterns (B10)
- N Dry-Season Water Table (C2)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3)
- N FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):
Water Table Present? Yes ____ No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PHOTO REPORT

Plot Number	ST140
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/14/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2897660007
Longitude (DD)	166.652005354

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST141
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/14/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2853683709
Longitude (DD)	166.648546056

Photo Type: Vegetation Direction: N

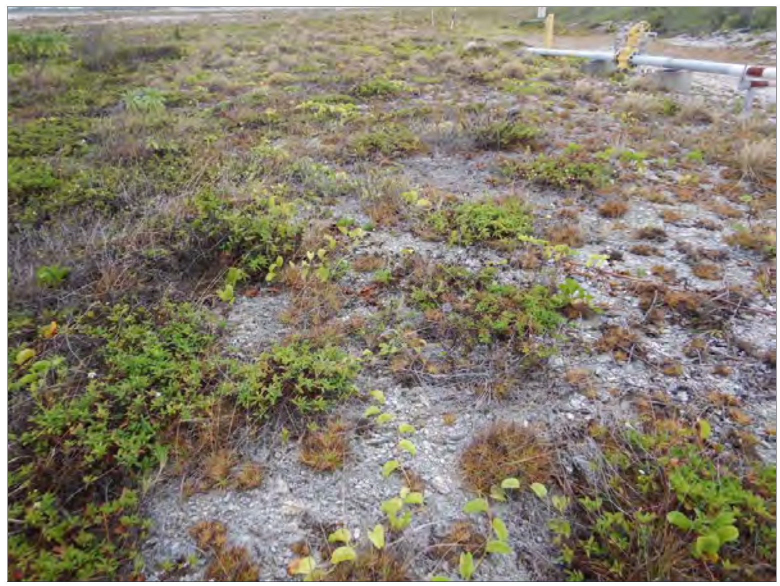

Photo Type: Vegetation Direction: S

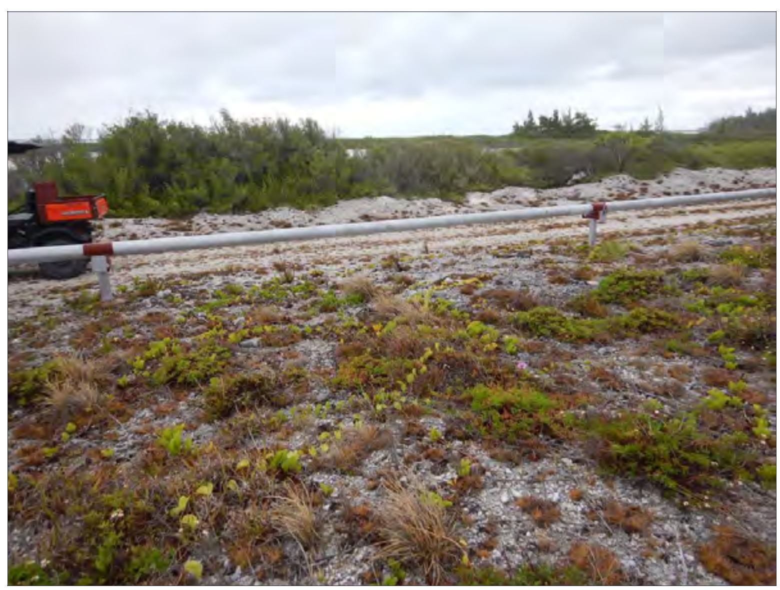

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST142
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/14/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3072312053
Longitude (DD)	166.635722401

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST143
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/14/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3049283806
Longitude (DD)	166.634428014

Photo Type: Vegetation Direction: N

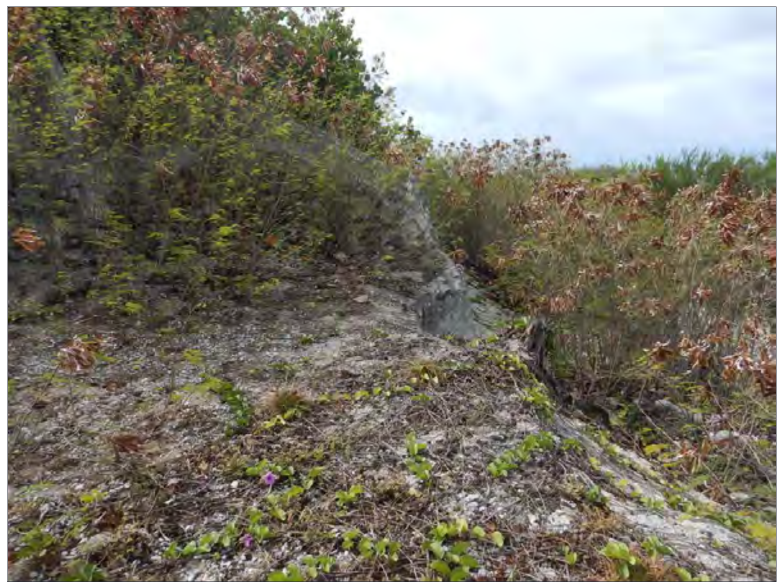

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST144
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/14/2023
NWI Classification	M2USN
Vegetation Type	Beach/Open Water
Latitude (DD)	19.304105497
Longitude (DD)	166.638527377

Photo Type: Hydrology Direction: NE

Photo Type: Hydrology Direction: NW

Photo Type: Hydrology Direction: SW

PHOTO REPORT

Plot Number	ST145
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/14/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3061994782
Longitude (DD)	166.642037443

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST146
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3081215292
Longitude (DD)	166.647221334

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST147
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/16/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3090814902
Longitude (DD)	166.647293449

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 3/16/23 Time: ______

Applicant/Owner: USAF State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 148

Investigator(s): Steve Reidsma TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): lowland - terrace Local relief (concave, convex, none): flat

Lat: N 19.30638 Long: E 166.64637 Datum: NAD83 Slope (%): 0

Soil Map Unit Name: coral NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No X
Hydric Soil Present?	Yes ______	No X
Wetland Hydrology Present?	Yes ______	No X

Is the Sampled Area within a Wetland? Yes ______ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1/10 acre)	Absolute % Cover	Dominant Species?	Indicator Status
1. CAS EQU ironwood	90	Y	F
2.			
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: 1/10 acre)			
1. GOS HIR	3	Y	UP
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- N 2 - Dominance Test is >50%
- N 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks:

no understory

QC

SOIL

Sampling Point: ST 148

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR5/2	100					SA	Cobbly
8-15	10YR7/2	100					SA	~~fine~~ Cobbly, med. sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- N Histosol (A1)
- N Histic Epipedon (A2)
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Muck Presence (A8)
- N Depleted Below Dark Surface (A11)
- N Thick Dark Surface (A12)
- N Sandy Gleyed Matrix (S4)
- N Sandy Redox (S5)
- N Dark Surface (S7)
- N Loamy Gleyed Matrix (F2)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- N Stratified Layers (A5)
- N Sandy Mucky Mineral (S1)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Inundation Visible on Aerial Imagery (B7)
- N Water-Stained Leaves (B9)
- N Aquatic Fauna (B13)
- N Tilapia Nests (B17)
- N Hydrogen Sulfide Odor (C1)
- N Oxidized Rhizospheres on Living Roots (C3)
- N Presence of Reduced Iron (C4)
- N Recent Iron Reduction in Tilled Soils (C6)
- N Thin Muck Surface (C7)
- N Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- N Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- N Surface Soil Cracks (B6)
- N Sparsely Vegetated Concave Surface (B8)
- N Drainage Patterns (B10)
- N Dry-Season Water Table (C2)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3)
- N FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PHOTO REPORT

Plot Number	ST148
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3063891231
Longitude (DD)	166.646370468

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 3/16/23 Time: ________

Applicant/Owner: USAF State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 149

Investigator(s): Steve Reidsma TMK/Parcel: ________

Landform (hillslope, coastal plain, etc.): atoll - terrace Local relief (concave, convex, none): flat

Lat: N 19. 30958 Long: E 166. 64586 Datum: NAD83 Slope (%): –

Soil Map Unit Name: Coral NWI classification: V

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: former golf course

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: –)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: 1/10 acre)			
1.			
2. Bidens alba/pilosa	20	Y	FU
3. CHA HIR/eup hir	3	N	FU
4.			
5.			
	23	= Total Cover	
Herb Stratum (Plot size: 1/10 acre)			
1. [illegible]	30	Y	F
2. flat blade grass	10	Y	F
3. POA sp.	10	Y	F
4.			
5.			
6.			
7.			
8.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: ________)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	50	x 3 = 150
FACU species	23	x 4 = 92
UPL species		x 5 =
Column Totals:	73 (A)	242 (B)

Prevalence Index = B/A = 3.32

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
Y 2 - Dominance Test is >50%
N 3 - Prevalence Index is ≤3.0[1]
____ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Bare = 25

2 grasses not ID'd, assume FAC

SOIL

Sampling Point: ST 149

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 4/3						SA	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- N Histosol (A1)
- N Histic Epipedon (A2)
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Muck Presence (A8)
- N Depleted Below Dark Surface (A11)
- N Thick Dark Surface (A12)
- N Sandy Gleyed Matrix (S4)
- N Sandy Redox (S5)
- N Dark Surface (S7)
- N Loamy Gleyed Matrix (F2)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- N Stratified Layers (A5)
- N Sandy Mucky Mineral (S1)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

3 holes all w/ shallow hard coral refusal

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Inundation Visible on Aerial Imagery (B7)
- N Water-Stained Leaves (B9)
- N Aquatic Fauna (B13)
- N Tilapia Nests (B17)
- N Hydrogen Sulfide Odor (C1)
- N Oxidized Rhizospheres on Living Roots (C3)
- N Presence of Reduced Iron (C4)
- N Recent Iron Reduction in Tilled Soils (C6)
- N Thin Muck Surface (C7)
- N Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- N Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- N Surface Soil Cracks (B6)
- N Sparsely Vegetated Concave Surface (B8)
- N Drainage Patterns (B10)
- N Dry-Season Water Table (C2)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3)
- N FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches):

Water Table Present? Yes ______ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches):

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PHOTO REPORT

Plot Number	ST149
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3059843865
Longitude (DD)	166.64586153

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST150
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/16/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2862061285
Longitude (DD)	166.648663915

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST151
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/16/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2868890021
Longitude (DD)	166.648699595

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST152
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2880916106
Longitude (DD)	166.648711477

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST153
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2877687667
Longitude (DD)	166.648526993

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST154
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/16/2023
NWI Classification	PUBP
Vegetation Type	Bare/Cleared
Latitude (DD)	19.2891260989
Longitude (DD)	166.647620933

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: SW

PHOTO REPORT

Plot Number	ST155
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/16/2023
NWI Classification	PUBP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2885768223
Longitude (DD)	166.648142819

Photo Type: Hydrology Direction: N2

Photo Type: Hydrology Direction: SE

Photo Type: Hydrology Direction: SW

PHOTO REPORT

Plot Number	ST156
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2885072928
Longitude (DD)	166.649674473

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST157
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3055814869
Longitude (DD)	166.647780372

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST158
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2986423068
Longitude (DD)	166.648318613

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST159
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2979187993
Longitude (DD)	166.649023322

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST160
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2978248178
Longitude (DD)	166.646449201

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST161
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2973001434
Longitude (DD)	166.647542696

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST162
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3055080351
Longitude (DD)	166.64092345

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST163
Wetland Status	OHW
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	M2USN
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3054943202
Longitude (DD)	166.641490247

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST164
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3055587735
Longitude (DD)	166.642014536

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: NE

Photo Type: Hydrology Direction: SE

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 3/17/23 Time: ______
Applicant/Owner: USAF State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 165
Investigator(s): Steve Reidsma TMK/Parcel: ______
Landform (hillslope, coastal plain, etc.): Terrace - Atoll Local relief (concave, convex, none): flat
Lat: N 19. 29352 Long: E 166. 64972 Datum: NAD83 Slope (%): –
Soil Map Unit Name: Coral NWI classification: ______
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ✓ (If no, explain in Remarks.)
Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______
Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ______
Hydric Soil Present?	Yes ______	No X
Wetland Hydrology Present?	Yes ______	No X

Is the Sampled Area within a Wetland? Yes ______ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1/10)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Ironwood cas equ	95	Y	F
3. Sea Scapa coc uvi	T	N	FU
4. pemphis acidula	T	N	F
5.			
= Total Cover			

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
Y 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ______

Remarks:

QC

SOIL

Sampling Point: ST 165

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
2-0	Oi							
0-13	C		7.5YR 6/2	100			SA	w gravel/cobble Cored

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- N Histosol (A1)
- N Histic Epipedon (A2)
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Muck Presence (A8)
- N Depleted Below Dark Surface (A11)
- N Thick Dark Surface (A12)
- N Sandy Gleyed Matrix (S4)
- N Sandy Redox (S5)
- N Dark Surface (S7)
- N Loamy Gleyed Matrix (F2)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- N Stratified Layers (A5)
- N Sandy Mucky Mineral (S1)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Coral

Depth (inches): 13

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- N Aquatic Fauna (B13)
- N Tilapia Nests (B17)
- N Hydrogen Sulfide Odor (C1)
- N Oxidized Rhizospheres on Living Roots (C3)
- N Presence of Reduced Iron (C4)
- N Recent Iron Reduction in Tilled Soils (C6)
- N Thin Muck Surface (C7)
- N Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- N Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- N Surface Soil Cracks (B6)
- N Sparsely Vegetated Concave Surface (B8)
- N Drainage Patterns (B10)
- N Dry-Season Water Table (C2)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3)
- N FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil - W - SE

PHOTO REPORT

Plot Number	ST165
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2935282063
Longitude (DD)	166.64972381

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST166
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2949965515
Longitude (DD)	166.649202333

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST167
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3042484368
Longitude (DD)	166.644476415

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: NE

Photo Type: Hydrology Direction: NW

PHOTO REPORT

Plot Number	ST168
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3049720595
Longitude (DD)	166.644227755

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST169
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3047601759
Longitude (DD)	166.643940968

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: NW

Photo Type: Hydrology Direction: SE

PHOTO REPORT

Plot Number	ST170
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2963241473
Longitude (DD)	166.648150512

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST171
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2919730215
Longitude (DD)	166.65055293

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST172
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/17/2023
NWI Classification	M2USN
Vegetation Type	Beach/Open Water
Latitude (DD)	19.290568887
Longitude (DD)	166.644864045

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST173
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2932719755
Longitude (DD)	166.644818538

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST174
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/17/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2935452797
Longitude (DD)	166.644287274

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST175
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.3053259287
Longitude (DD)	166.642093281

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: NA

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST176
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/18/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3052942785
Longitude (DD)	166.642486299

Photo Type: Hydrology Direction: NE

Photo Type: Hydrology Direction: E2

Photo Type: Hydrology Direction: SW

PHOTO REPORT

Plot Number	ST177
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.30444601
Longitude (DD)	166.645377699

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST178
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3047570094
Longitude (DD)	166.644801463

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST179
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3046699151
Longitude (DD)	166.647399801

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST180
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3055649929
Longitude (DD)	166.646954211

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST181
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.304729716
Longitude (DD)	166.637548941

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST182
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3046577126
Longitude (DD)	166.638171107

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST183
Wetland Status	OHW
Plot Type	WB: Waterbody
Plot Date	3/18/2023
NWI Classification	M2USN
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3042422274
Longitude (DD)	166.6391682

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST184
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Tangantangan shrub
Latitude (DD)	19.3044766752
Longitude (DD)	166.639036362

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 3/18/23 Time: ______

Applicant/Owner: USAF State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 185

Investigator(s): Steve Reidsma TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): atoll Local relief (concave, convex, none): flat

Lat: N 19. 3056 Long: E 166. 6430 Datum: NAD83 Slope (%): 0

Soil Map Unit Name: Coral NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No X	Is the Sampled Area within a Wetland? Yes ______ No X
Hydric Soil Present?	Yes ______ No X	
Wetland Hydrology Present?	Yes ______ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Cas equ	45	Y	F
3. Cor sub	45	Y	UP
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ~~50~~ 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	~~45~~	x 2 =
FAC species	45	x 3 = 135
FACU species		x 4 =
UPL species	45	x 5 = 225
Column Totals:	90 (A)	360 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

N 2 - Dominance Test is >50%

N 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks:

SOIL

Sampling Point: ST 185

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-13	C 7.5YR 6/3	100					SA	coral gravel/cobble

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Muck Presence (A8)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Dark Surface (S7)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- Stratified Layers (A5)
- Sandy Mucky Mineral (S1)
- Red Parent Material (F21)
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: coral

Depth (inches): 13

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Tilapia Nests (B17)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Salt Deposits (C5)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PHOTO REPORT

Plot Number	ST185
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Corida forest
Latitude (DD)	19.3056581587
Longitude (DD)	166.643010513

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST186
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2992623989
Longitude (DD)	166.645978983

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST187
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2976587543
Longitude (DD)	166.642820322

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST188
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Cordia forest
Latitude (DD)	19.2966359811
Longitude (DD)	166.643929095

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST189
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Cordia forest
Latitude (DD)	19.2898039579
Longitude (DD)	166.645648306

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST190
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2868251155
Longitude (DD)	166.646879963

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST191
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2878657277
Longitude (DD)	166.647636125

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST192
Wetland Status	Wetland
Plot Type	FVP: Field Verification Point
Plot Date	3/18/2023
NWI Classification	PSS1P
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2878664424
Longitude (DD)	166.646911072

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST193
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2824746334
Longitude (DD)	166.649199384

Photo Type: Vegetation Direction: N

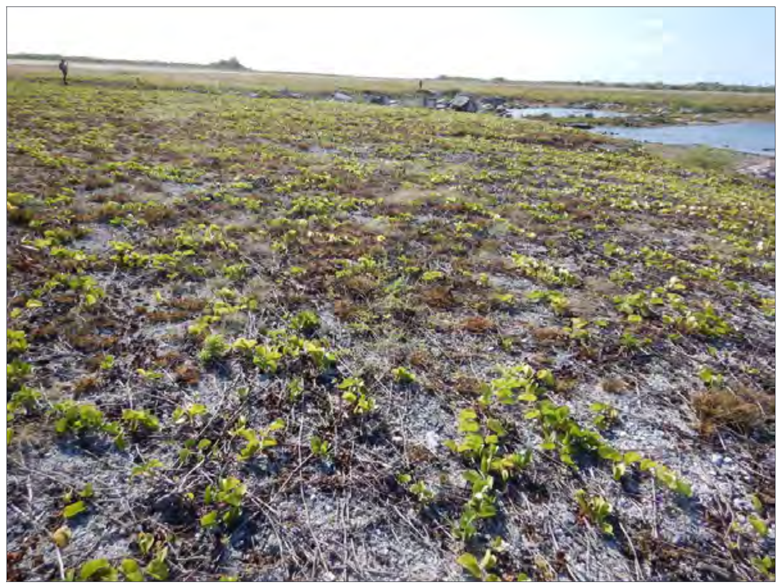

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST194
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2817512614
Longitude (DD)	166.648456101

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST195
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/19/2023
NWI Classification	PUBHx
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2824811183
Longitude (DD)	166.64870411

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST196
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.283537464
Longitude (DD)	166.647241614

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST197
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2873134232
Longitude (DD)	166.649526127

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST198
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/19/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2875866593
Longitude (DD)	166.649102275

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST199
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.287917015
Longitude (DD)	166.649588202

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST200
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/19/2023
NWI Classification	PUBP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2882380823
Longitude (DD)	166.649341448

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 3/19/23 Time: ______

Applicant/Owner: USAF State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 201

Investigator(s): Steve Reidsma TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): atoll - terrace Local relief (concave, convex, none): flat

Lat: N 19. Long: E 166. Datum: NAD83 Slope (%): —

Soil Map Unit Name: Coral NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? Yes ___ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1/10 acre)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Ironwood, CASEQU	85	Y	F
3.			
4.			
5.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ______)			
1. Sea purslane / SES POR	T	N	F
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	85	x 3 = 255
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	85 (A)	255 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- Y 2 - Dominance Test is >50%
- Y 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: ST 201

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	*KSC		7.5YR4/2	100			SA	
3-14	BC		10YR7/2	100			SA	Coral

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

N Histosol (A1)
N Histic Epipedon (A2)
N Black Histic (A3)
N Hydrogen Sulfide (A4)
N Muck Presence (A8)
N Depleted Below Dark Surface (A11)
N Thick Dark Surface (A12)
N Sandy Gleyed Matrix (S4)
N Sandy Redox (S5)
N Dark Surface (S7)
N Loamy Gleyed Matrix (F2)
N Depleted Matrix (F3)
N Redox Dark Surface (F6)
N Depleted Dark Surface (F7)
N Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

N Stratified Layers (A5)
N Sandy Mucky Mineral (S1)
N Red Parent Material (F21)
N Very Shallow Dark Surface (F22)
N Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

N Surface Water (A1)
N High Water Table (A2)
N Saturation (A3)
N Water Marks (B1)
N Sediment Deposits (B2)
N Drift Deposits (B3)
N Algal Mat or Crust (B4)
N Iron Deposits (B5)
N Inundation Visible on Aerial Imagery (B7)
N Water-Stained Leaves (B9)
N Aquatic Fauna (B13)
N Tilapia Nests (B17)
N Hydrogen Sulfide Odor (C1)
N Oxidized Rhizospheres on Living Roots (C3)
N Presence of Reduced Iron (C4)
N Recent Iron Reduction in Tilled Soils (C6)
N Thin Muck Surface (C7)
N Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
N Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

N Surface Soil Cracks (B6)
N Sparsely Vegetated Concave Surface (B8)
N Drainage Patterns (B10)
N Dry-Season Water Table (C2)
N Salt Deposits (C5)
N Stunted or Stressed Plants (D1)
N Geomorphic Position (D2)
N Shallow Aquitard (D3)
N FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):
Water Table Present? Yes ____ No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil - w. C

PHOTO REPORT

Plot Number	ST201
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2876890698
Longitude (DD)	166.649569776

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST202
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Mowed/Maintained
Latitude (DD)	19.2887570938
Longitude (DD)	166.648283718

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST203
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/19/2023
NWI Classification	PUBM
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2880923398
Longitude (DD)	166.648439964

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: S

PHOTO REPORT

Plot Number	ST204
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2879800958
Longitude (DD)	166.648595954

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST205
Wetland Status	Waterbody
Plot Type	WB: Waterbody
Plot Date	3/19/2023
NWI Classification	PUBP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2878929043
Longitude (DD)	166.64934177

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: NE

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST206
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/19/2023
NWI Classification	U
Vegetation Type	Bare/Cleared
Latitude (DD)	19.2882663086
Longitude (DD)	166.649319091

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SW

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST207
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/20/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3089154966
Longitude (DD)	166.640021822

Photo Type: Hydrology Direction: E

Photo Type: Hydrology Direction: N

Photo Type: Hydrology Direction: W

PHOTO REPORT

Plot Number	ST208
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/20/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3085553921
Longitude (DD)	166.640419272

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: W Direction: W

PHOTO REPORT

Plot Number	ST209
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/20/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3072804901
Longitude (DD)	166.645689431

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST210
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/20/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3074786845
Longitude (DD)	166.64637833

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST211
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/20/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3039750666
Longitude (DD)	166.646321457

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST212
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/20/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3052423014
Longitude (DD)	166.646114709

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST213
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/20/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3060348348
Longitude (DD)	166.644572411

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST214
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3090716915
Longitude (DD)	166.644252654

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST215
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Sea Grape forest/shrub
Latitude (DD)	19.3085992328
Longitude (DD)	166.643731009

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST216
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3090274474
Longitude (DD)	166.646496891

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST217
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Sea Grape forest/shrub
Latitude (DD)	19.3081201566
Longitude (DD)	166.644440458

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Wake Island Facility Expansion City: N/A Sampling Date: 5/21/23 Time: ______

Applicant/Owner: USAF / Brice State/Terr/Comlth.: USA Island: Wake Sampling Point: ST 218

Investigator(s): Steve Reidsma TMK/Parcel: ______

Landform (hillslope, coastal plain, etc.): atoll – terrace Local relief (concave, convex, none): convex – slight

Lat: N 19. 30706 Long: E 166. 64350 Datum: NAD83 Slope (%): ______

Soil Map Unit Name: Gravel NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1/10)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Coco	T	N	FU
3. Tournefortia	T	N	FU
4.			
5.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5m)			
1.			
2. Bidens pil	75	Y	FU
3. Cha / Eup Hir	T	N	FU
4. Cle GAN spider (GYNGYN)	3	N	UP
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2. Grass POA sp	10	Y	F
3.			
4.			
5.			
6.			
7.			
8.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	10	x 3 = 30
FACU species	75	x 4 = 300
UPL species	3	x 5 = 15
Column Totals:	88 (A)	345 (B)

Prevalence Index = B/A = 3.92

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

N 2 - Dominance Test is >50%

N 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: BARE = 10

SOIL

Sampling Point: ST 218

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	7.5YR 6/3	100					SA	Coral

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- N Histosol (A1)
- N Histic Epipedon (A2)
- N Black Histic (A3)
- N Hydrogen Sulfide (A4)
- N Muck Presence (A8)
- N Depleted Below Dark Surface (A11)
- N Thick Dark Surface (A12)
- N Sandy Gleyed Matrix (S4)
- N Sandy Redox (S5)
- N Dark Surface (S7)
- N Loamy Gleyed Matrix (F2)
- N Depleted Matrix (F3)
- N Redox Dark Surface (F6)
- N Depleted Dark Surface (F7)
- N Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- N Stratified Layers (A5)
- N Sandy Mucky Mineral (S1)
- N Red Parent Material (F21)
- N Very Shallow Dark Surface (F22)
- N Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- N Surface Water (A1)
- N High Water Table (A2)
- N Saturation (A3)
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Inundation Visible on Aerial Imagery (B7)
- N Water-Stained Leaves (B9)
- N Aquatic Fauna (B13)
- N Tilapia Nests (B17)
- N Hydrogen Sulfide Odor (C1)
- N Oxidized Rhizospheres on Living Roots (C3)
- N Presence of Reduced Iron (C4)
- N Recent Iron Reduction in Tilled Soils (C6)
- N Thin Muck Surface (C7)
- N Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- N Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- N Surface Soil Cracks (B6)
- N Sparsely Vegetated Concave Surface (B8)
- N Drainage Patterns (B10)
- N Dry-Season Water Table (C2)
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- N Geomorphic Position (D2)
- N Shallow Aquitard (D3)
- N FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches):

Water Table Present? Yes ______ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches):

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PHOTO REPORT

Plot Number	ST218
Wetland Status	Upland
Plot Type	WD: Wetland Determination
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3070683924
Longitude (DD)	166.643507624

Photo Type: Soils Direction: NA

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

PHOTO REPORT

Plot Number	ST219
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.306875821
Longitude (DD)	166.640846816

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST220
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/21/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.3012070954
Longitude (DD)	166.645108825

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST221
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.2916760404
Longitude (DD)	166.64675476

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST222
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2911236055
Longitude (DD)	166.645533899

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST223
Wetland Status	Wetland
Plot Type	WB: Waterbody
Plot Date	3/24/2023
NWI Classification	M2ABN
Vegetation Type	Beach/Open Water
Latitude (DD)	19.2872654848
Longitude (DD)	166.647808493

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST224
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2873795048
Longitude (DD)	166.64796125

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST225
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.2871374829
Longitude (DD)	166.648248193

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST226
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3070645307
Longitude (DD)	166.642198814

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST227
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.308341659
Longitude (DD)	166.641660021

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST228
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.3025373971
Longitude (DD)	166.644547893

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST229
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.3013528474
Longitude (DD)	166.642775761

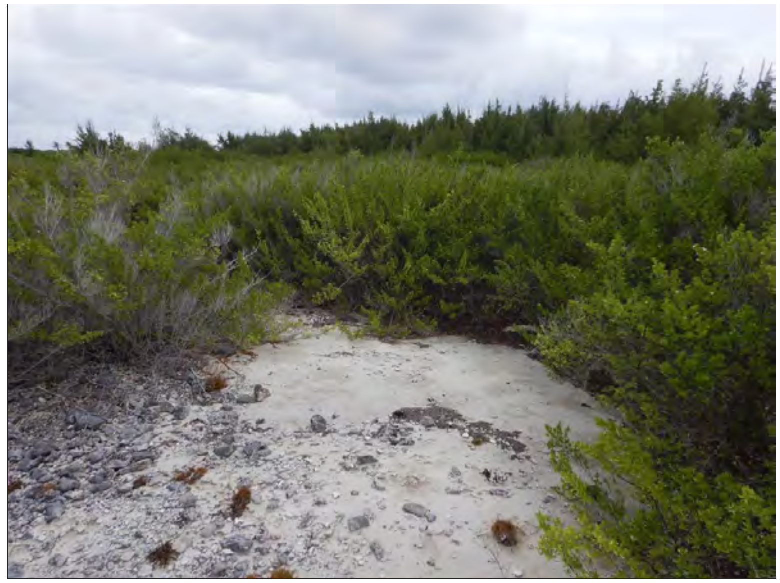

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST230
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Pemphis shrub
Latitude (DD)	19.3015228427
Longitude (DD)	166.64360823

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST300
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.2792170015
Longitude (DD)	166.645394188

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST301
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.280620393
Longitude (DD)	166.635596214

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST302
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2827558904
Longitude (DD)	166.627886199

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST303
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/24/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2883244265
Longitude (DD)	166.615787014

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST304
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.2766945365
Longitude (DD)	166.651507186

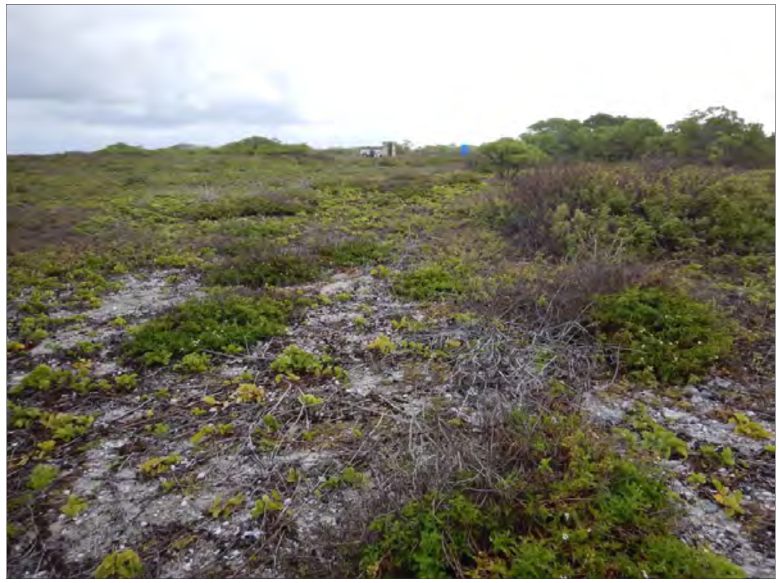

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST305
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Corida forest
Latitude (DD)	19.2760751932
Longitude (DD)	166.650299648

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST306
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.2743782116
Longitude (DD)	166.652653133

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST307
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2731405245
Longitude (DD)	166.654982997

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST308
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2745396265
Longitude (DD)	166.646441936

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST309
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Sea Grape forest/shrub
Latitude (DD)	19.2733983097
Longitude (DD)	166.652270743

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST310
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Scaevola shrub
Latitude (DD)	19.2752438614
Longitude (DD)	166.647934809

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST311
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Casuarina forest
Latitude (DD)	19.2769546895
Longitude (DD)	166.643750062

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST312
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.2940203085
Longitude (DD)	166.611515297

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST313
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/25/2023
NWI Classification	U
Vegetation Type	Cordia forest
Latitude (DD)	19.2902869431
Longitude (DD)	166.613007369

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

PHOTO REPORT

Plot Number	ST350
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.2992882927
Longitude (DD)	166.600732256

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST351
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/16/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3021748605
Longitude (DD)	166.600308581

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST400
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Cordia forest
Latitude (DD)	19.30595246
Longitude (DD)	166.63120354

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST401
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3069293931
Longitude (DD)	166.630068695

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: S

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST402
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.309209581
Longitude (DD)	166.628505691

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST403
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3106222146
Longitude (DD)	166.62664156

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST404
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Tangantangan shrub
Latitude (DD)	19.311377242
Longitude (DD)	166.626413819

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SE

PHOTO REPORT

Plot Number	ST405
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Ruderal shrub
Latitude (DD)	19.3120442751
Longitude (DD)	166.625107864

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST406
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3158172443
Longitude (DD)	166.619267608

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: NW

Photo Type: Vegetation Direction: SW

PHOTO REPORT

Plot Number	ST407
Wetland Status	HTL
Plot Type	WB: Waterbody
Plot Date	3/15/2023
NWI Classification	M2USP
Vegetation Type	Beach/Open Water
Latitude (DD)	19.3168573279
Longitude (DD)	166.618646521

Photo Type: Hydrology Direction: NW

Photo Type: Hydrology Direction: SE

Photo Type: Vegetation Direction: NE

PHOTO REPORT

Plot Number	ST408
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3159781402
Longitude (DD)	166.618366011

Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: NE

Photo Type: Vegetation Direction: W

PHOTO REPORT

Plot Number	ST409
Wetland Status	Upland
Plot Type	FVP: Field Verification Point
Plot Date	3/15/2023
NWI Classification	U
Vegetation Type	Tournefortia forest
Latitude (DD)	19.3073937653
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Photo Type: Vegetation Direction: E

Photo Type: Vegetation Direction: N

Photo Type: Vegetation Direction: W

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Appendix C WETLAND DELINEATION DETAIL FIGURES

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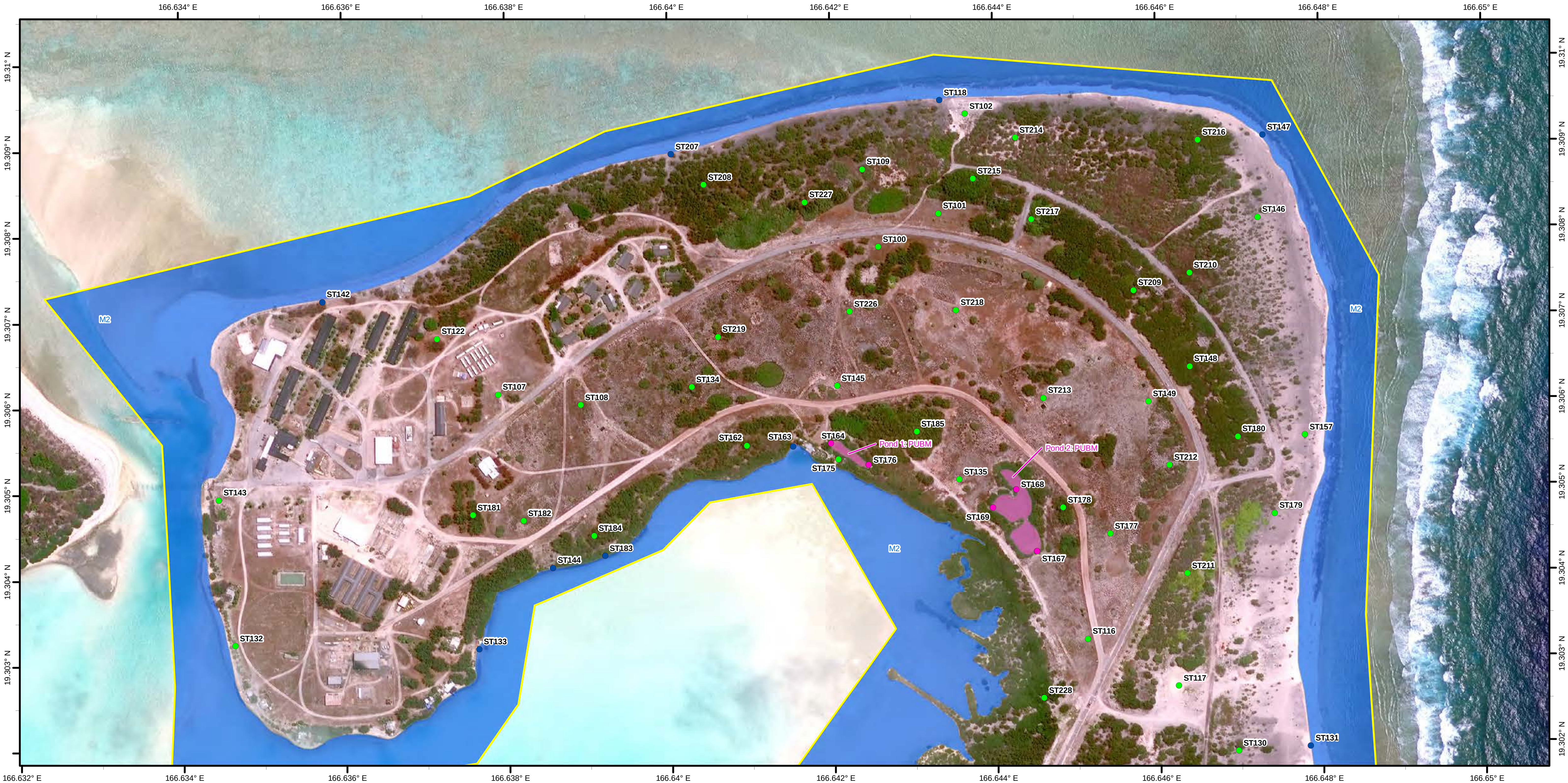
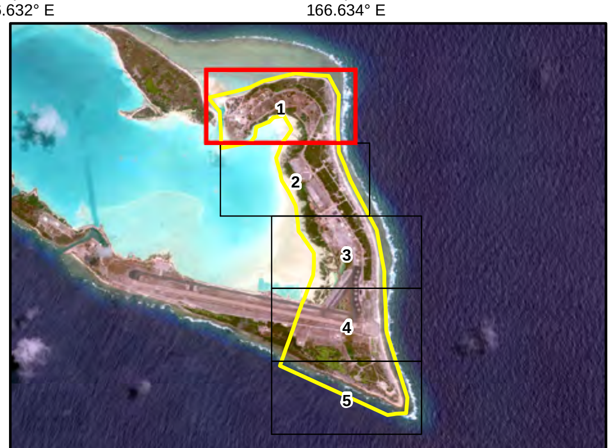




All data points have associated photographs with photo directions labeled in Appendix B.
Field data forms are presented concurrently with photos in Appendix B.

Imagery: WorldView-2; June 17, 2019
Coordinate System: WGS 1984 UTM Zone 58N
Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Field Plot by Status

- Upland
- Wetland
- Waterbody
- Tide Line

Wetlands and Waters Mapping Labeled by Cowardin

- Wetland (All wetlands PSS1P Cowardin Code)
- Pond
- Marine Water

0 200 400 600 Feet

(At original document size of 11x17)
1:4,800 1 in = 400 feet

N E S W

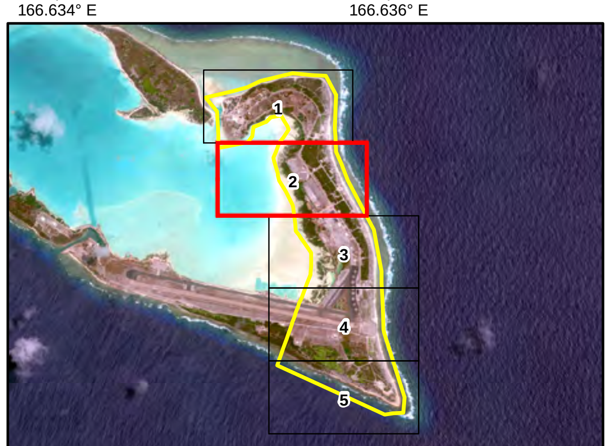
Client
Brice Environmental Services Corporation

Project
Wake Island Airfield Wetland Delineation

Figure
Wetlands and Waters Detail

Figure Number
C - 1

Stantec



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Imagery: WorldView-2; June 17, 2019
Coordinate System: WGS 1984 UTM Zone 58N
Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Field Plot by Status

- Upland
- Wetland
- Waterbody
- Tide Line

Wetlands and Waters Mapping Labeled by Cowardin

- Wetland (All wetlands PSS1P Cowardin Code)
- Pond
- Marine Water

0 200 400 600 Feet

(At original document size of 11x17)
1:4,800 1 in = 400 feet

N W E S

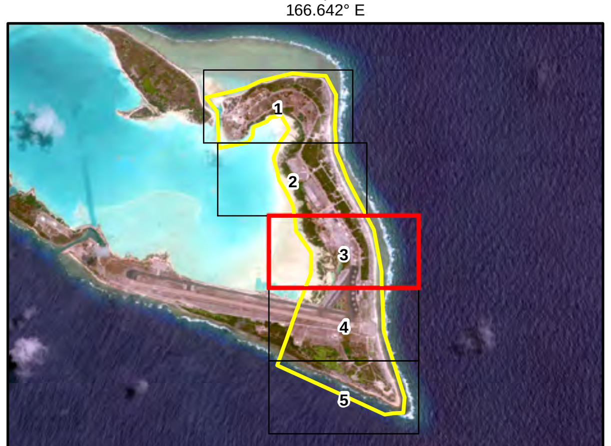
Client
Brice Environmental Services Corporation

Project
Wake Island Airfield Wetland Delineation

Figure
Wetlands and Waters Detail

Figure Number
C - 2

Stantec



All data points have associated photographs with photo directions labeled in Appendix B.
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Imagery: WorldView-2; June 17, 2019
Coordinate System: WGS 1984 UTM Zone 58N
Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Field Plot by Status

- Upland
- Wetland
- Waterbody
- Tide Line

Wetlands and Waters Mapping Labeled by Cowardin

- Wetland (All wetlands PSS1P Cowardin Code)
- Pond
- Marine Water

0 200 400 600 Feet

(At original document size of 11x17)
1:4,800 1 in = 400 feet

N W E S

Client
Brice Environmental Services Corporation

Project
Wake Island Airfield Wetland Delineation

Figure
Wetlands and Waters Detail

Figure Number
C - 3

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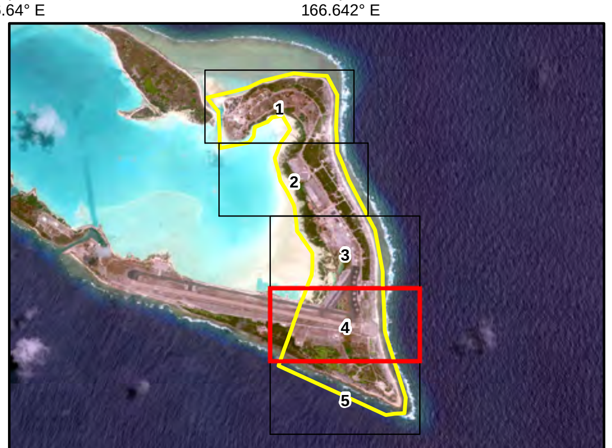

All data points have associated photographs with photo directions labeled in Appendix B.
Field data forms are presented concurrently with photos in Appendix B.

Imagery: WorldView-2; June 17, 2019
Coordinate System: WGS 1984 UTM Zone 58N
Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Field Plot by Status

- Upland
- Wetland
- Waterbody
- Tide Line

Wetlands and Waters Mapping Labeled by Cowardin

- Wetland (All wetlands PSS1P Cowardin Code)
- Pond
- Marine Water

0 200 400 600 Feet

(At original document size of 11x17)

1:4,800 1 in = 400 feet

N E S W

Client

Brice Environmental Services Corporation

Project

Wake Island Airfield Wetland Delineation

Figure

Wetlands and Waters Detail

Figure Number

C - 4

Stantec

All data points have associated photographs with photo directions labeled in Appendix B.
Field data forms are presented concurrently with photos in Appendix B.

Imagery: WorldView-2; June 17, 2019
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Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Field Plot by Status

- Upland
- Wetland
- Waterbody
- Tide Line

Wetlands and Waters Mapping Labeled by Cowardin

- Wetland (All wetlands PSS1P Cowardin Code)
- Pond
- Marine Water

0 200 400 600 Feet

(At original document size of 11x17)
1:4,800 1 in = 400 feet

N W E S

Client
Brice Environmental Services Corporation

Project
Wake Island Airfield Wetland Delineation

Figure
Wetlands and Waters Detail

Figure Number
C - 5

Stantec

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Appendix D VEGETATION DETAIL FIGURES

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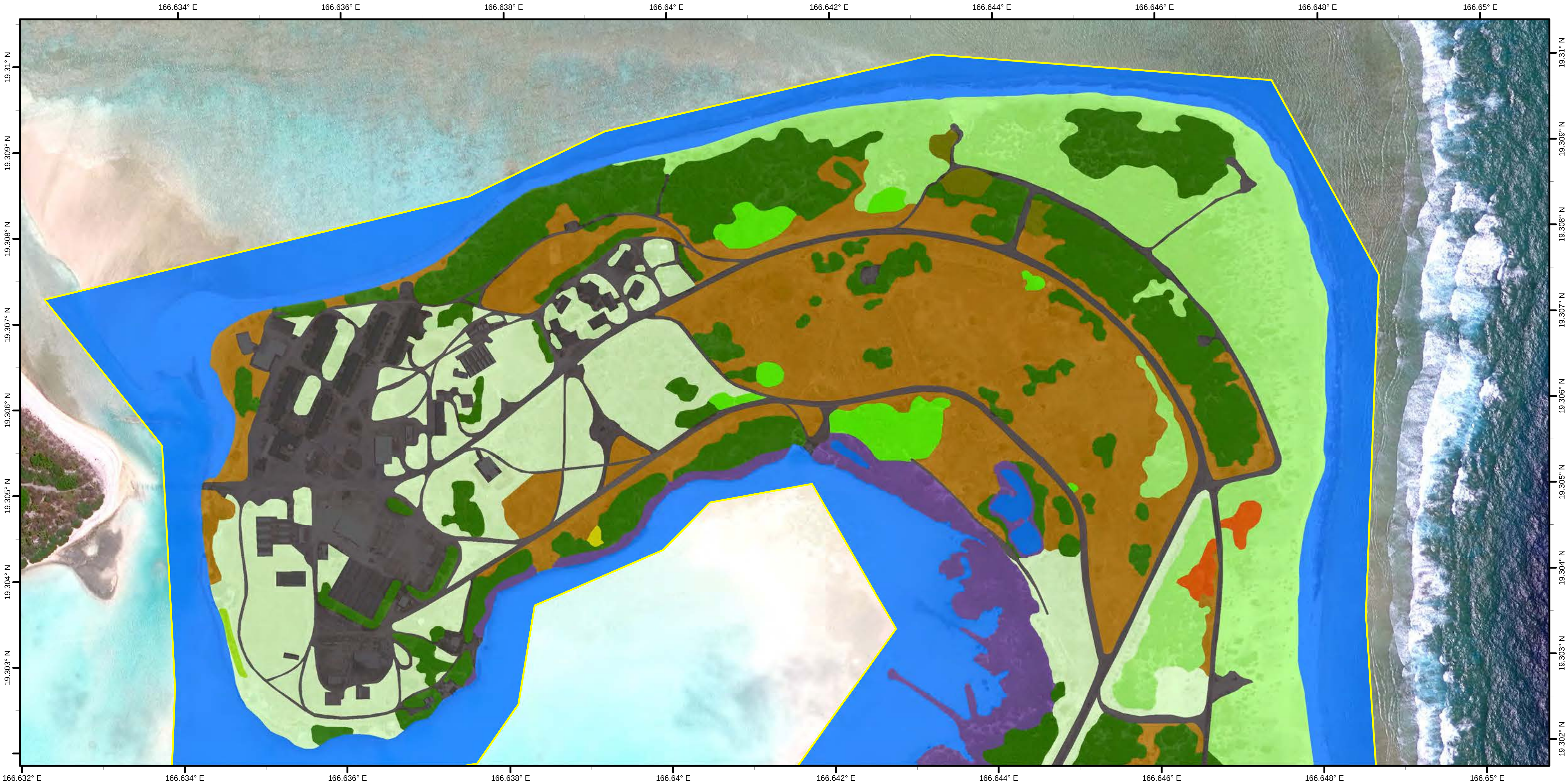

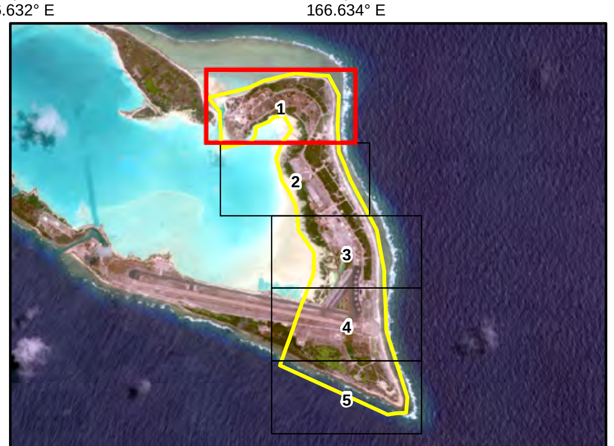

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Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Vegetation Classification

- Casuarina Forest
- Coconut Forest
- Cordia Forest
- Tournefortia Forest
- Misc. Trees
- Ruderal
- Tangantangan Shrub
- Scaevola Shrub
- Pemphis Shrub
- Mowed/Maintained
- Bare/Cleared
- Open Water

0 200 400 600 Feet

(At original document size of 11x17)
1:4,800 1 in = 400 feet

N S E W

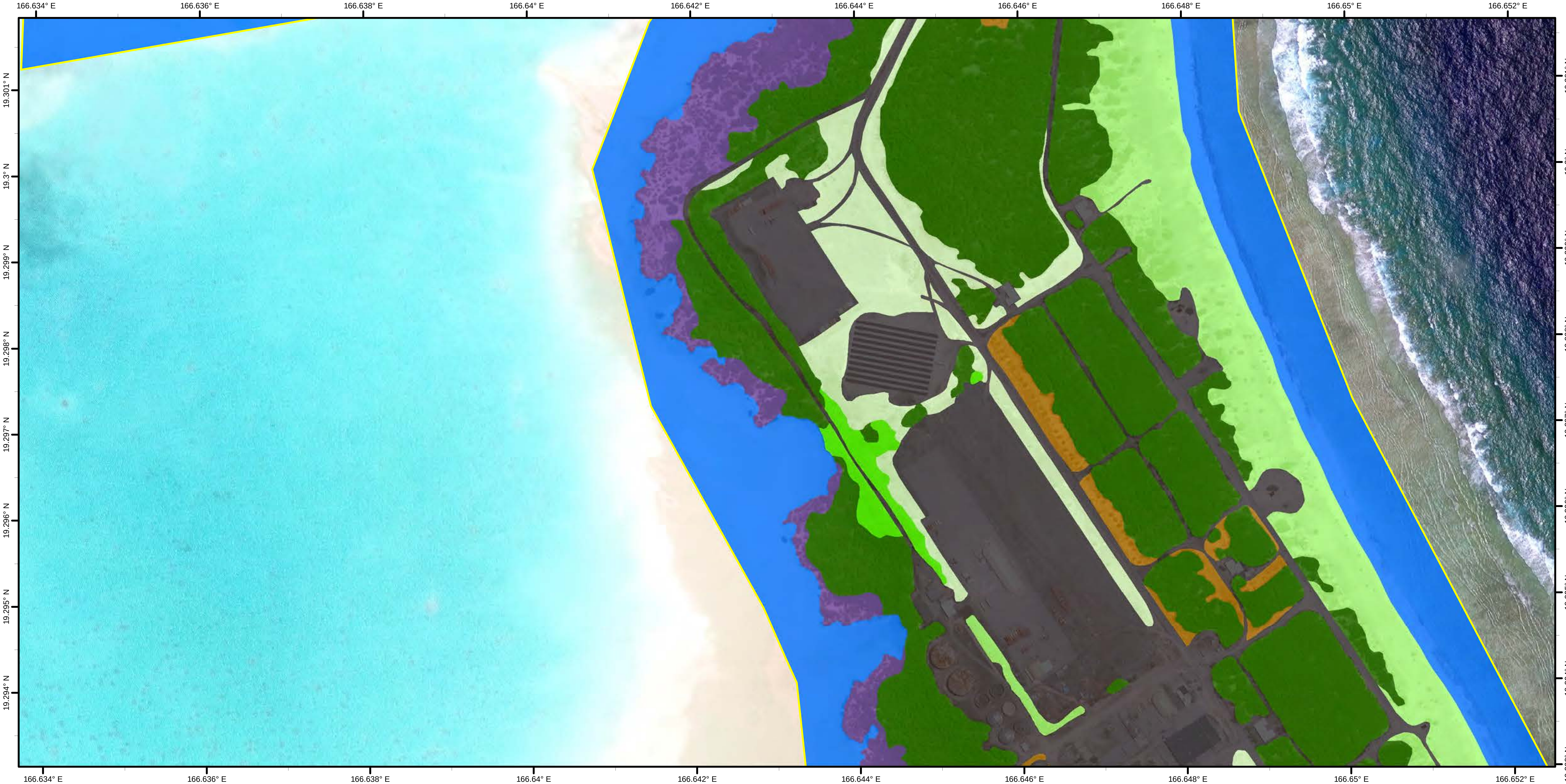
Client
Brice Environmental Services Corporation

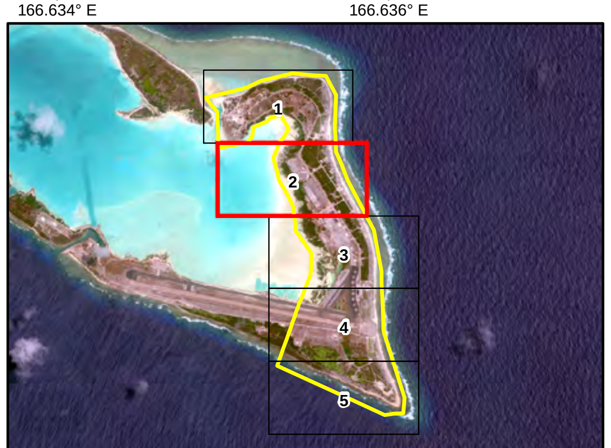
Project
Wake Island Airfield Wetland Delineation

Figure
Vegetation Detail

Figure Number
D - 1

Stantec





Imagery: WorldView-2; June 17, 2019
Coordinate System: WGS 1984 UTM Zone 58N
Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Vegetation Classification

- Casuarina Forest
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- Tournefortia Forest
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- Ruderal
- Tangantangan Shrub
- Scaevola Shrub
- Pemphis Shrub
- Mowed/Maintained
- Bare/Cleared
- Open Water

0 200 400 600 Feet

(At original document size of 11x17)

1:4,800 1 in = 400 feet

N S E W

Client

Brice Environmental Services Corporation

Project

Wake Island Airfield Wetland Delineation

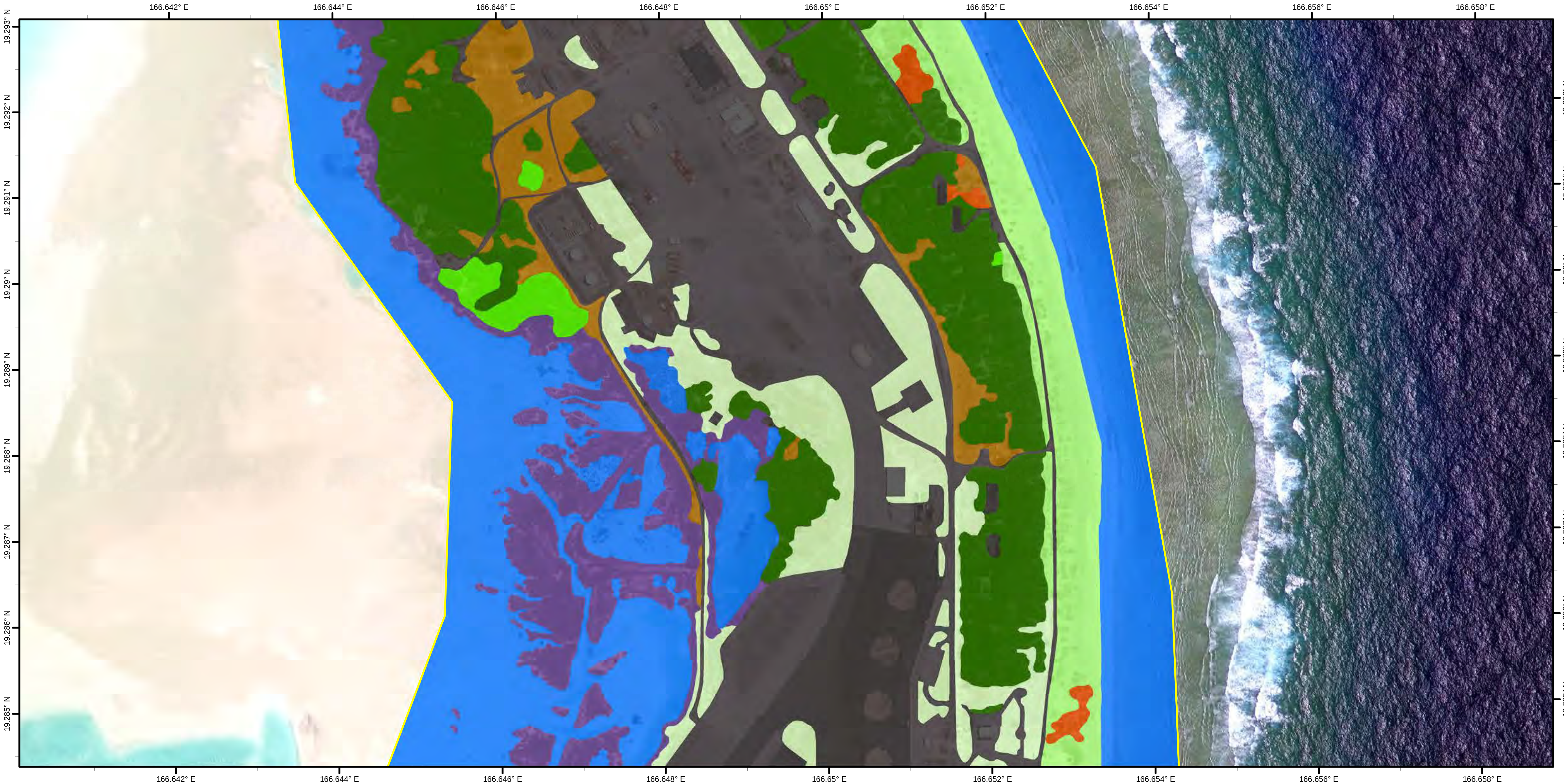
Figure

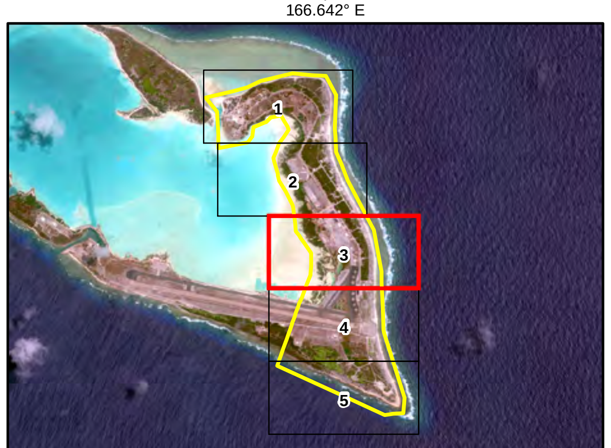
Vegetation Detail

Figure Number

D - 2

Stantec





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Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Vegetation Classification

- Casuarina Forest
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- Tournefortia Forest
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- Ruderal
- Tangantangan Shrub
- Scaevola Shrub
- Pemphis Shrub
- Mowed/Maintained
- Bare/Cleared
- Open Water

0 200 400 600 Feet

N W E S

(At original document size of 11x17)

1:4,800 1 in = 400 feet

Client

Brice Environmental Services Corporation

Project

Wake Island Airfield Wetland Delineation

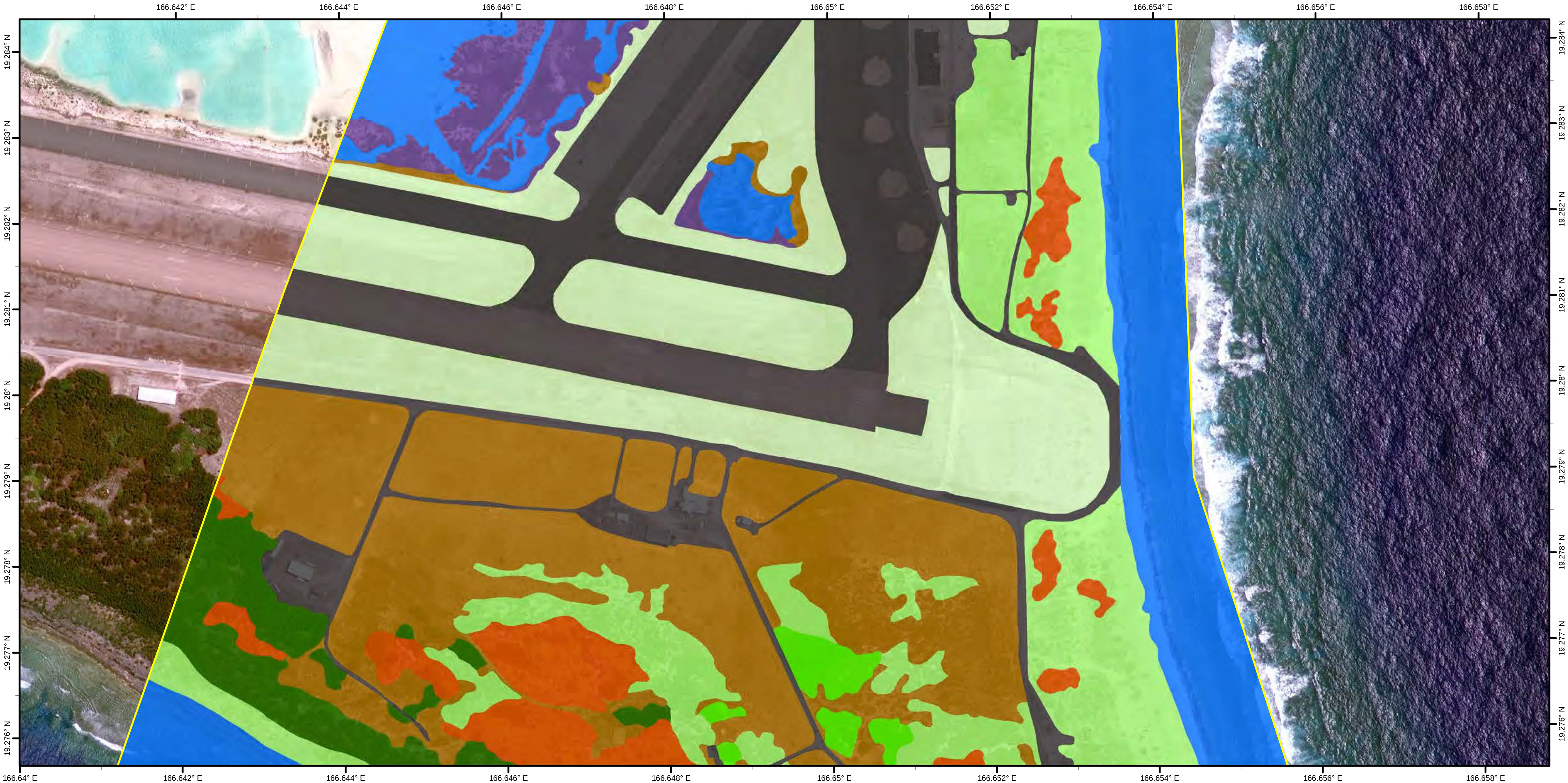
Figure

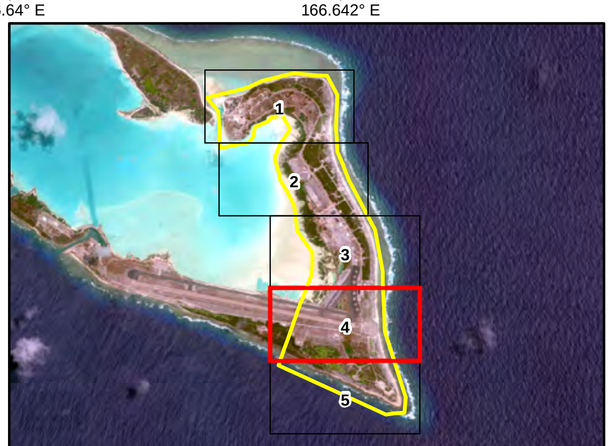
Vegetation Detail

Figure Number

D - 3

Stantec





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Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Vegetation Classification

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- Pemphis Shrub
- Mowed/Maintained
- Bare/Cleared
- Open Water

0 200 400 600 Feet

(At original document size of 11x17)

1:4,800 1 in = 400 feet

N E S W

Client

Brice Environmental Services Corporation

Project

Wake Island Airfield Wetland Delineation

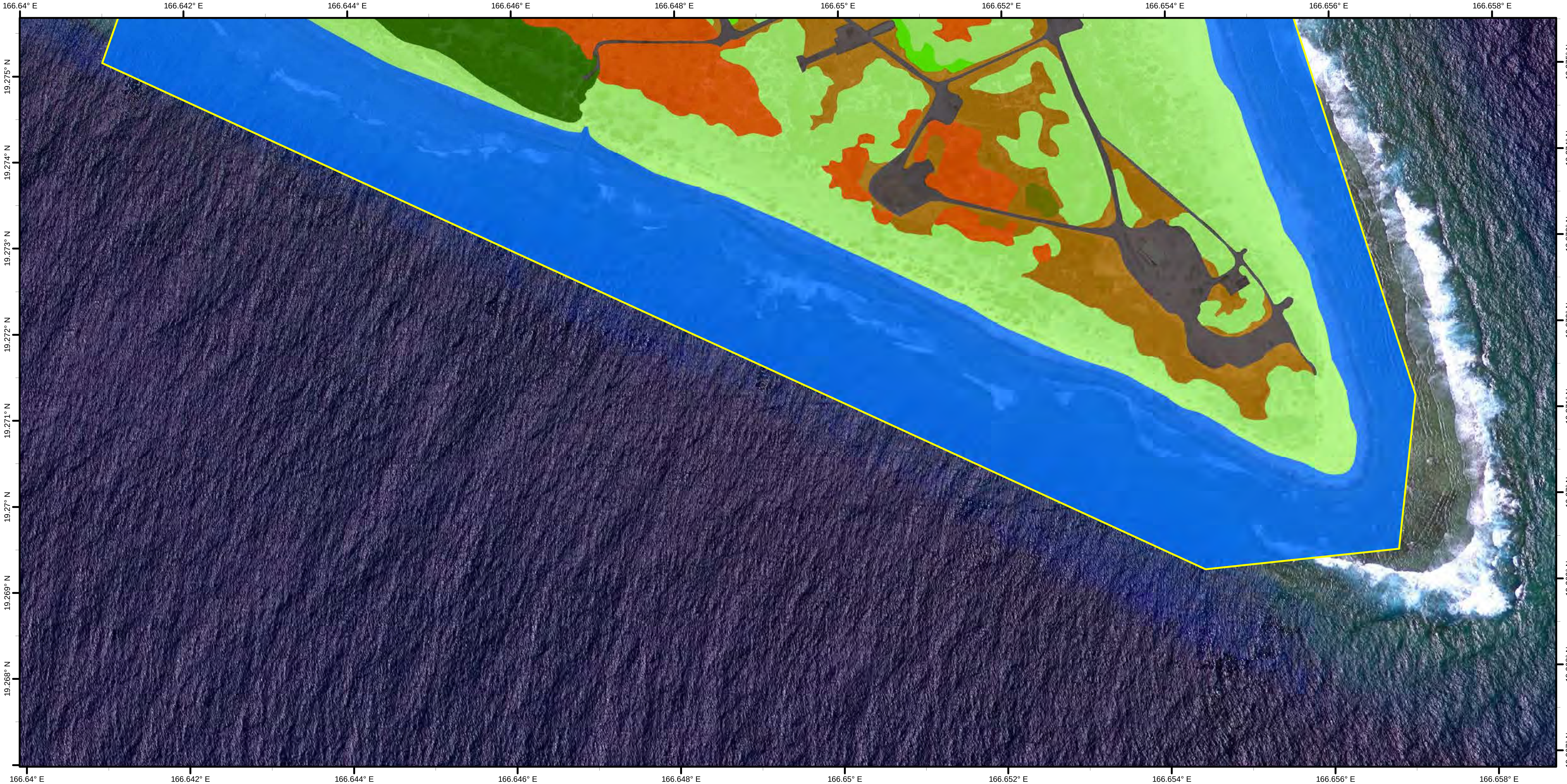
Figure

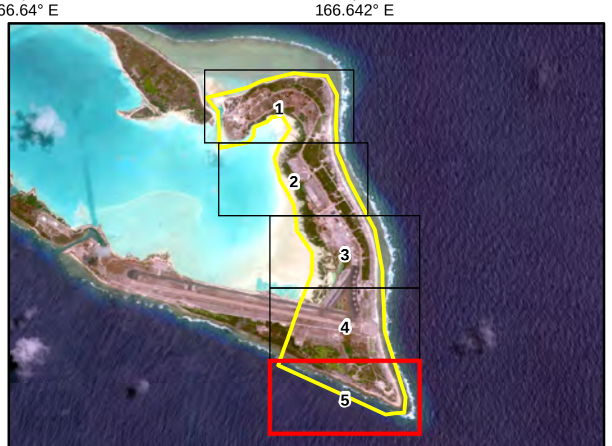
Vegetation Detail

Figure Number

D - 4

Stantec





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Coordinate System: WGS 1984 UTM Zone 58N
Projection: Transverse Mercator
Datum: WGS 1984

Study Area

Vegetation Classification

- Casuarina Forest
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- Open Water

0 200 400 600 Feet

(At original document size of 11x17)

1:4,800 1 in = 400 feet

N E S W

Client

Brice Environmental Services Corporation

Project

Wake Island Airfield Wetland Delineation

Figure

Vegetation Detail

Figure Number

D - 5

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APPENDIX D
BIOLOGICAL EVALUATION REPORT

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FINAL

BIOLOGICAL EVALUATION
FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITY, BASE LIVING QUARTERS, AND AIRCRAFT PARKING APRON AT WAKE ISLAND AIRFIELD, UNITED STATES

Prepared by:
Department of the Air Force
611th Civil Engineer Squadron
10471 20th Street Suite 302, JBER, AK 99506-2201

August 2024

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FIGURES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
AGE	aerospace ground equipment
B	Building
BD	Behavioral Disturbance
BE	biological evaluation
BMP	best management practice
CEIE	Civil, Environmental and Infrastructure Engineering Element
CES	Civil Engineer Squadron
CFR	Code of Federal Regulations
CSF	Consolidated Base Support Facility
dB	decibel
dBA	A-weighted decibel
DFAC	dining facility
DPS	distinct population segment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	U.S. Federal Highway Administration
FT	federally threatened
GST	green sea turtle
HF	high frequency
HST	hawksbill sea turtles
INRMP	Integrated Natural Resources Management Plan
MBTA	Migratory Bird Treaty Act
MDA	Missile Defense Agency
mg/L	milligrams per liter
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MUS	management unit species
ng/L	nanograms per liter
NGDC	National Geophysical Data Center
NMFS	National Marine Fisheries Service
No.	number
NOAA	National Oceanic and Atmospheric Administration
ONMS	Office of National Marine Sanctuaries
POL	petroleum, oil, and lubricants
PRIMNM	Pacific Remote Islands Marine National Monument
PRSC	Pacific Air Forces Regional Support Center
PTS	Permanent Threshold Shift

ACRONYMS AND ABBREVIATIONS (CONTINUED)

RCNM	Road Noise Construction Model
TTS	Temporary Threshold Shift
U.S.	United States
USAF	U.S. Air Force
USFWS	U.S. Fish and Wildlife Service
VORTAC	Very High Frequency Omnidirectional Range/Tactical Aircraft Control
WIA	Wake Island Airfield

1.0 INTRODUCTION

The purpose of this biological evaluation (BE) is to evaluate the potential effects to federally listed species from construction of a new Consolidated Base Support Facility (CSF), Base Operations (Base Ops) Facility, Base Living Quarters, and aircraft parking apron at Wake Island, United States, to protect threatened and/or endangered species and designated critical habitat in accordance with the Endangered Species Act (ESA), in consultation with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA)-National Marine Fisheries Service (NMFS). Section 2.0 contains a detailed description of the proposed action. This BE also includes an essential fish habitat (EFH) consultation, developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (Section 5.0).

Wake Atoll is a reef-enclosed lagoon located approximately 2,000 nautical miles west of Honolulu, Hawaiʻi, and is an unincorporated, unorganized territory of the U.S. under administrative control of the U.S. Air Force (USAF). Wake Atoll is under installation command authority of the Pacific Air Forces Regional Support Center (PRSC), 11th Air Force, headquartered at Joint Base Elmendorf-Richardson, Alaska, with the 15th Wing at Hickam Air Force Base in Oahu, Hawaiʻi assuming support responsibilities.

The 2.5-square-mile atoll consists of three coral islands formed by an underwater volcano --Peale, Wake, and Wilkes-- arranged in a “wishbone” shape with Wake Island as the dominant “V” shaped feature and Peale and Wilkes creating the wishbone’s “arms” on the north and south, respectively (USAF 2023a) (Figure 1-1). The natural channel between Wakes Island and Wilkes Island is currently blocked by a solid fill causeway. The channel between Wake Island and Peale Island was once bridged by a concrete causeway constructed by occupying Japanese forces during World War II, and later by a wooden bridge that has since burned down. Wake Island, the main and largest island on the atoll, is the only inhabited island on the atoll, where fewer than 100 USAF personnel, contractors, and employees live and work (USAF 2023a).

Four distinct activity areas directly support the operation of Wake Island Airfield (WIA): the airport; the industrial area; Downtown; and the harbor/petroleum, oil, and lubricants (POL) storage area (PRSC 2020). Other areas include the former golf course between Downtown and the industrial area, and a recycling yard/scrap metal storage area. The Missile Defense Agency (MDA) leases land on the island (Table 1-1).

Table 1-1 Activity Areas of Wake Island

AREA	LOCATION	INFRASTRUCTURE
Airport	Southern half of Wake Island	The airport consists of a runway, supporting taxiways, a parking apron, an airport terminal, and a communications facility.
Industrial area	Central portion of Wake Island	This area includes the civil engineering building; aviation and airfield maintenance shops; fire and rescue; aircraft refueling support facilities (Area 1500); supply and warehouse buildings; a reverse osmosis water purification plant providing potable water to the island; potable water storage tanks; and warehouse and distribution centers.
Downtown	North of the industrial area	This area supports housing, cafeteria, laundry, medical, retail, and recreational buildings, as well as a power generator and satellite communications facility.
Harbor/POL storage area	Southwestern arm of Wake Island	This area includes docking and warehouse facilities and is connected by a causeway to the bulk fuel/POL storage area (fuel farm) on the southeastern end of Wilkes Island. It also includes

Table 1-1 Activity Areas of Wake Island

AREA	LOCATION	INFRASTRUCTURE
		Building 1730, a former VORTAC north of the taxiway on the western end of Wake Island.
Other areas	Area between the Downtown and Industrial area	This area contains the remnants of a former golf course. It was once the location of housing, school, and medical facilities for Civil Aeronautics Authority and commercial airline employees which were removed after the Vietnam refugee airlift of the mid-1970s.
	Southwestern portion of Wake Island	This area includes a recycling yard and scrap metal storage areas.
	MDA area	This area is leased to the MDA, which supports a variety of testing and training mission-related equipment and infrastructure. This area also contains a solid waste accumulation area for the island.

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USAF 2020, 2023a; Jacobs 2021.

1.1 Species Addressed in the Biological Evaluation

The proposed action has the potential to impact five listed species (Table 1-2) that may occur in the in the "action area," as described in Section 2.2 (the airport, industrial area, and Downtown). The species list is based on the USFWS Information for Planning and Consultation (IPaC) tool, email technical assistance from Mr. James Kwon, Biologist, USFWS, and Mr. Richard Hall, Fishery Policy Analyst, NOAA-NMFS. Species are further described in Section 3.0.

Table 1-2 Species and Effects Determinations Covered Under this Biological Evaluation

COMMON NAME	SCIENTIFIC NAME	ESA STATUS	EFFECTS DETERMINATION
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	May affect, not likely to adversely affect
Green sea turtle (Central West Pacific DPS)	*Chelonia mydas*	Endangered	May affect, not likely to adversely affect
Coral	*Acropora speciosa*	Threatened	May affect, not likely to adversely affect
Coral	*Acropora retusa*	Threatened	May affect, not likely to adversely affect
Coral	*Acropora globiceps*	Threatened	May affect, not likely to adversely affect

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: USFWS 2023, NOAA 2023b.

1.2 Species Not Included in the Biological Evaluation

The species listed in Table 1-3 have been excluded from this BE. Although these species may be encountered at Wake Atoll, their occurrence has not been documented.

Table 1-3 Species Excluded from this Biological Evaluation

SPECIES	SCIENTIFIC NAME	ESA STATUS
Band-rumped storm-petrel	*Oceanodroma castro*	Endangered
Hawaiian petrel	*Pterodroma sandwichensis*	Endangered
Short-tailed albatross	*Phoebastria (=Diomedea) albatrus*	Endangered
Olive Ridley sea turtle	*Lepidochelys olivacea*	Threatened
Loggerhead sea turtle (South Pacific DPS)	*Caretta caretta*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Scalloped hammerhead shark (Indo-West Pacific DPS, West Coast Region)	*Sphyrna lewini*	Threatened
Ocean whitetip shark	*Carcharhinus longimanus*	Threatened
Giant manta ray	*Manta birostris*	Threatened
Chambered nautilus	*Nautilus pompilius*	Threatened
Coral	*Acropora jacquelineae*	Threatened
Coral	*Isopora crateriformis*	Threatened
Coral	*Seriatopora aculeata*	Threatened
Coral	*Euphyllia paradivisa*	Threatened
Blue whale	*Balaenoptera musculus*	Endangered
False killer whale (Main Hawaiian Islands Insular DPS)	*Pseudorca crassidens*	Endangered
Fin whale	*Balaenoptera physalus*	Endangered
Humpback whale	*Megaptera novaeangliae*	Endangered
Killer whale (Southern Resident DPS, Alaska West Coast Region)	*Orcinus orca*	Endangered
Sei whale	*Balaenoptera borealis*	Endangered
Sperm whale	*Physeter macrocephalus*	Endangered
Hawaiian monk seal	*Neomonachus schauinslandi*	Endangered

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Sources: USFWS 2023; NOAA 2023b.

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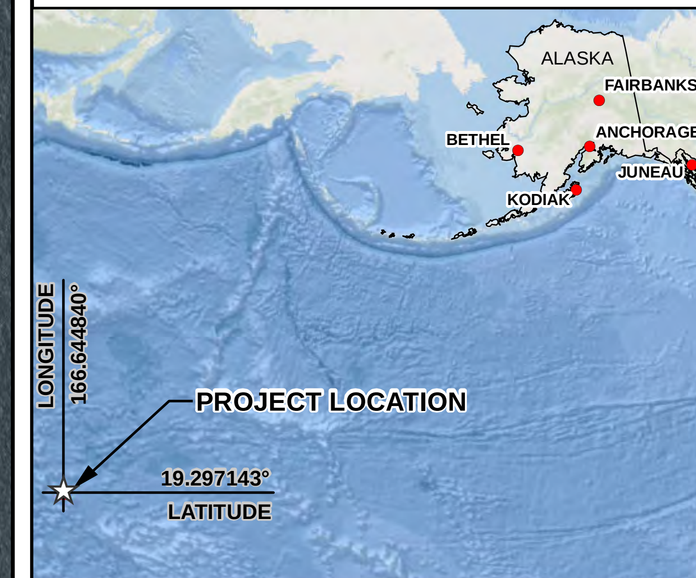
1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

SITE LOCATION AND VICINITY



Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Main map satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Location map Imagery source: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors.

WGS 1984 UTM ZONE 4 N, METERS
HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

2,500 1,250 0 2,500 5,000
Feet

PROJECT No.: 321804	DATE: 7/22/2024	FIGURE: 1-1
P.M.: S.B.	DRAWN: T.A.	

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2.0 DETAILS OF THE PROPOSED ACTION

2.1 Description of the Project Objective(s)

The proposed action consists of several projects. USAF is proposing to construct a new CSF, Base Ops Facility, Base Living Quarters, and aircraft parking apron. This will involve construction of 22 new buildings; demolition of 49 dilapidated Cold War-era buildings and a former aircraft parking apron immediately north of the existing Bravo Apron; relocation of memorials; and rerouting Wake Avenue. Existing facilities on Wake Island were constructed in the 1960s, and the deteriorated buildings are approaching the end of their serviceable lifespans. Problems include failing infrastructure; mold; inadequate internal systems (heating, ventilation, and air conditioning; fire suppression; electrical; etc.); and insufficient storage, housing, and office space. In addition, they do not meet current USAF building and safety standards and are located within historic rogue wave and storm surge inundation zones, making them susceptible to flooding.

2.2 Action Area

The proposed action is comprised of four projects occurring at different areas of the island (collectively the “action area”): the industrial area, Downtown, and the airport. Figures 2-1A through 2-1D show the locations of the proposed action.

2.2.1 Consolidated Base Support Facility

A new CSF will be constructed at the former golf course north of WIA, to include a standalone dining facility (DFAC) with centralized dry and cold food storage areas as well as kitchen and serving areas; and a separate consolidated facility that includes a fitness center, medical clinic, billeting office, and base laundry. Two generator buildings housing new generators will also be constructed, as well as all associated utilities, roads, sidewalks, parking, and site improvements. B1103 (base laundry), B1104 (DFAC), B1105 (cold storage), B1107 (cold storage), B1128 (dormitory/physical fitness center), and B2100 (former golf course clubhouse) will be demolished.

2.2.2 Base Operations Facility

This project will involve demolition of Building (B) 106 (defunct chapel), B1502 (existing Base Ops Facility), and B1503 (generator building, including the existing generator); and construction of a new facility approximately 175 feet east and 300 feet north of the existing facility, to include an associated passenger terminal, USAF and non-USAF administration offices, a postal service center, bank counter, secure areas, air traffic control tower, and generator building housing a new generator, as well as all associated utilities, roads, sidewalks, a personally-owned vehicle parking lot, and site improvements. An aerospace ground equipment (AGE) storage area will also be constructed. Memorials will be relocated east of the new facility.

2.2.3 Base Living Quarters

Existing lodging facilities on Wake Island consist of dormitories, duplexes, an open bay facility, and tents to accommodate surge. Larger construction contracts provide containerized housing unit facilities for their personnel. The existing lodging facilities will be demolished and the new Base Living Quarters will be constructed adjacent to the new CSF in the area of the former golf course.

The project includes demolition of 20 buildings that will be excess after construction is complete, including B1115 (visiting officer's quarters), B1116 (visiting airman quarters), B1117 (airman dormitory), B1118 (airman dormitory), and B1120 (airman dormitory).

In anticipation of future housing demand, the Living Quarters area will contain enough space to construct two additional two-story dormitories.

2.2.4 Aircraft Parking Apron

Construction of a new parking apron will allow WIA to accommodate aircraft with longer wingspans to taxi in and out and will increase the baseline capacity by eight. This will involve demolition of B130 (abandoned facility), B201 (water pump station), B202 (water pump station), B1401 (base engineering administrative building), B1402 (supply warehouse), B1403 (vehicle maintenance shop), B1406 (vehicle maintenance shop), B1408 (base engineer maintenance shop), B1409 (base engineer maintenance shop), B1410 (base engineer maintenance shop), B1411 (engineer repair shop), B1416, B1504 (former fire station), B1513 (warehouse), B1514 (air conditioning/refrigeration shop), B1515 (diesel fillstand), B1519 (vehicle maintenance shop), B1522 (existing Aircraft Rescue and Fire Fighting Station, to be replaced approximately 400 feet north of the new Base Ops Facility), B1550 (Fuel Lab 1), and B1551 (Fuel Lab 2). Wake Avenue will be realigned to accommodate the new parking apron and AGE storage area. The existing taxilane at the airfield will be rebuilt and realigned to ensure adequate wingtip clearance for aircraft and provide a seamless, logical extension of Taxilane Alpha (Jacobs 2021).

2.3 Description of How the Project Will Be Implemented

Project implementation will begin in fiscal year (FY) 2027 with the aircraft parking apron.

2.4 Environmental Baseline of the Action Area

2.4.1 Wake Island Terrestrial Environment

Wake Island has an average elevation of 12 feet and a maximum elevation of 21 feet above mean sea level. The seaward face of the island maintains a fairly uniform elevation of approximately 18 feet, with a gradual slant toward the center of the island and then to the lagoon (USAF 2023a). Each of the islands is characterized by fairly level terrain. There are three high points on the atoll, each exceeding 20 feet: on the northern tip of Wake Island at Heel Point; on Peale Island about 1,500 feet from the northwest tip of the island; and on Wilkes Island on the lagoon side about 2,250 feet from the northwest tip of the island (USAF 2023a). Collectively, the three islands include approximately 1,747 acres. Each arm of the "wishbone" is approximately 4 miles in length, and combined they measure nearly 9 miles from tip to tip.

The widest point of the Atoll is 2 miles, measured between Heel Point and Peacock Point on Wake Island. The Pacific shoreline and lagoon shoreline combined measure nearly 25 miles (USAF 2023a).

Broad coral-cobble beaches occur along the northern seaward sides of Peale and Wake Islands. The beaches range in width from 60 to about 510 feet, with an average width of 300 feet. Mobile limestone cobbles contacting weathered ancient coral heads have created a relatively smooth pavement in the intertidal zone. Natural sandy terraces and embankments exist only in limited locations. The most notable sandy terraces and embankments occur along the northern coast of Peale Island and the western and northwestern shores of Wilkes Island. Some pristine white sand beaches occur on the lagoon side of Peale Island (USAF 2023a).

The ground surface on Wake Atoll is composed of disintegrated coral interspersed with coral cobble. A typical pedogenic profile consists of sand, shells, coral, and limestone that are often intermixed. The substrate is coarse-grained and almost completely composed of calcium carbonate and is droughty and desiccating to plants. Fertility is very low due to the lack of essential nutrients and organic matter. Soil formation processes are precluded by high winds, high waves, and localized inundation of the atoll. As a result, soil formation on Wake Atoll is minimal (USAF 2023a).

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1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED PROJECTS AT WAKE ISLAND

FIGURE 2-1C - PROPOSED NEW PARKING APRON

FIGURE 2-1B - PROPOSED NEW CSF AND LIVING QUARTERS

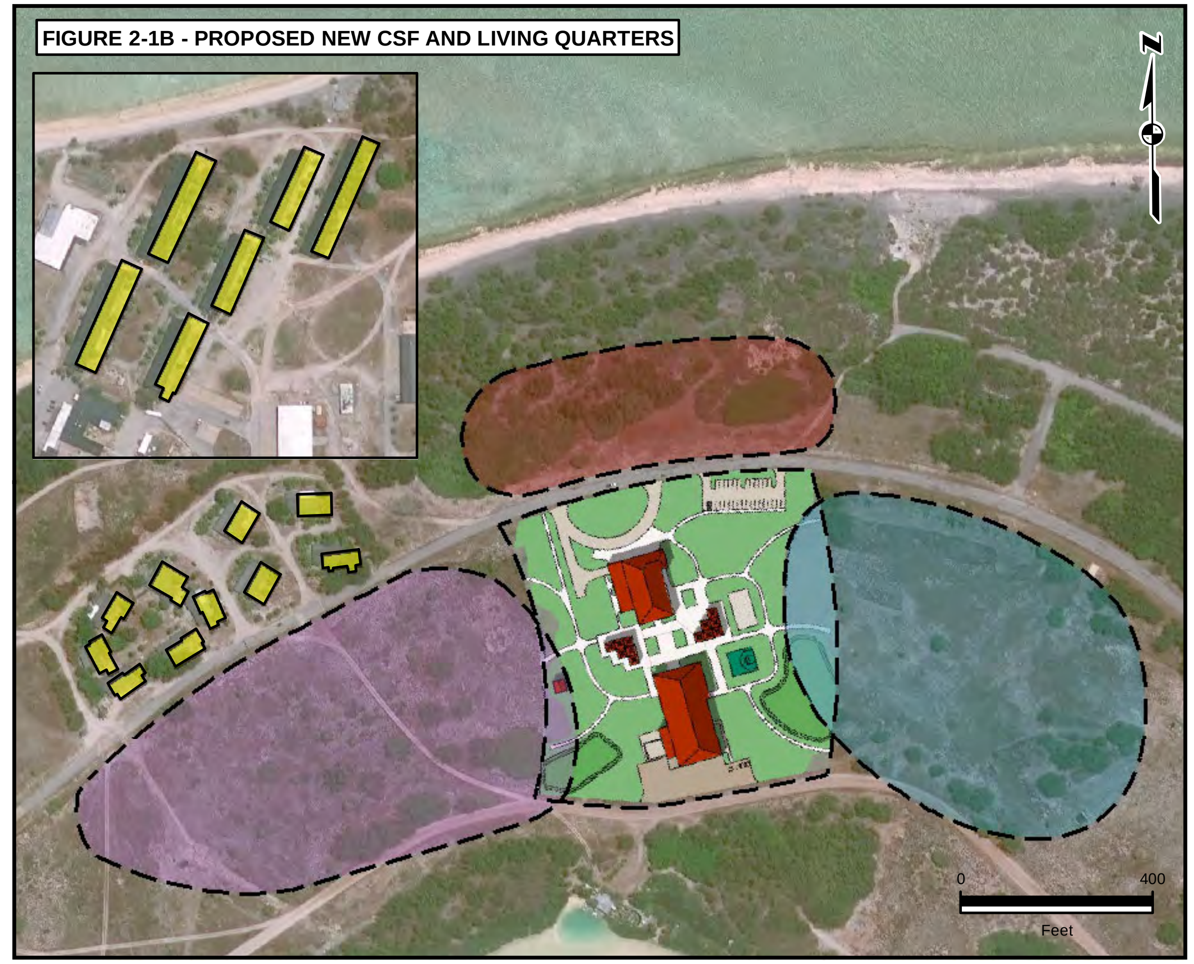

FIGURE 2-1D - PROPOSED BASE OPS FACILITY

Legend

- Proposed Building
- Proposed PCC HD Pavement
- Proposed PCC MD Pavement
- Proposed PCC LD Pavement
- Proposed PCC Sport Court
- Proposed Sand Surface
- Proposed Disturbed/Cleared Area
- Proposed Stormwater Basin
- Building to be Demolished

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed project features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

PROJECT No.: 321804	DATE: 8/12/2024	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2-1A

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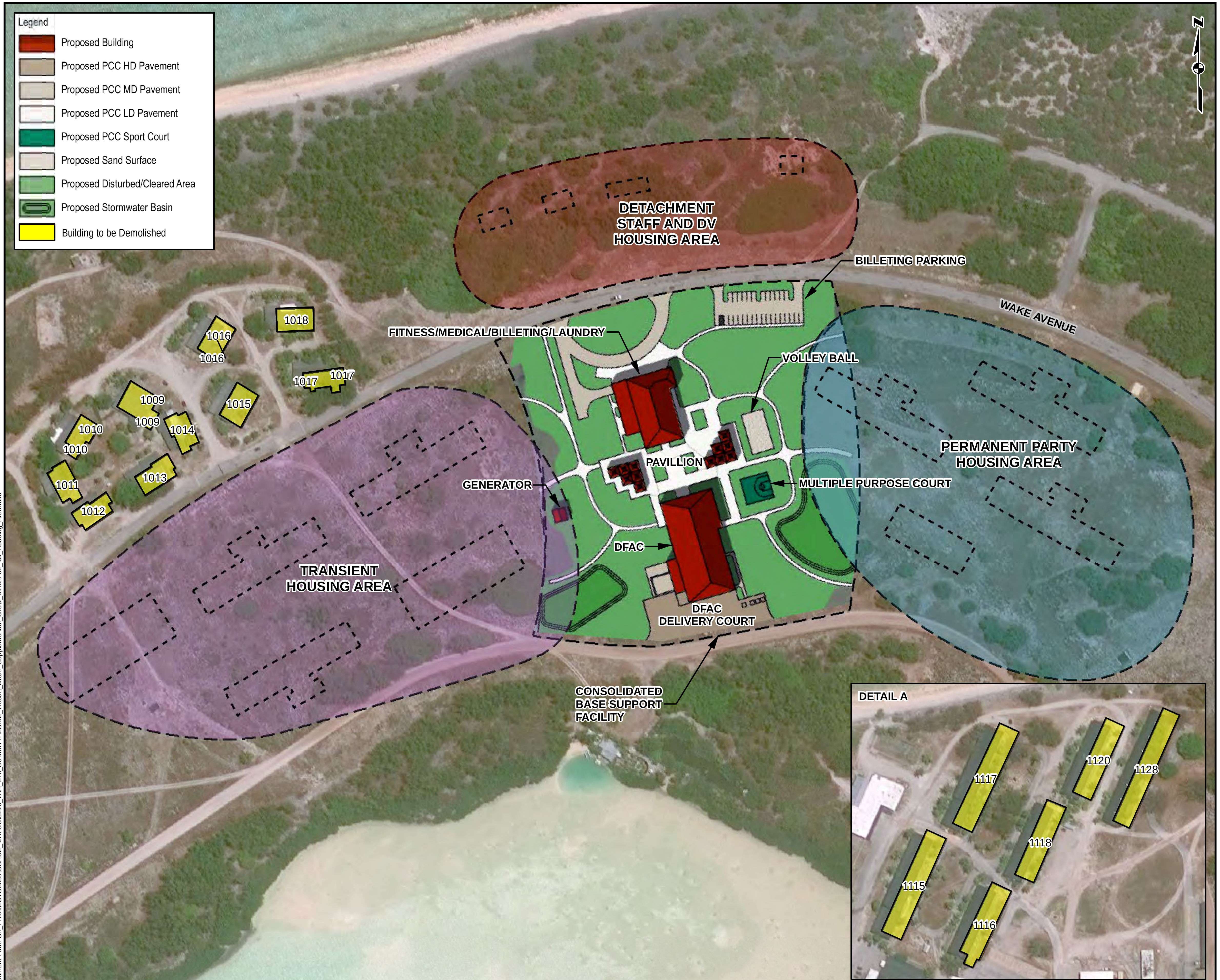

BIOLOGICAL EVALUATION FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED NEW CSF AND LIVING QUARTERS

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed CSF and Living Quarters features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.
3. Proposed CSF and Living Quarters features sourced from 611 CES/CEIE. ND. *MILCON Planning Charrette Report II*. Maps prepared by Jacobs Solutions Inc.

WGS 1984 UTM ZONE 4 N, METERS
HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

200 100 0 200 400
Feet

PROJECT No.: 321804	DATE: 8/12/2024	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2-1B

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BIOLOGICAL EVALUATION FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS
WAKE ISLAND, UNITED STATES

PROPOSED NEW PARKING APRON

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed Parking Apron features sourced from 611 CES/CEIE. ND. *Wake Island Apron PCR Concept 2*. Map prepared by Jacobs Solutions Inc.

WGS 1984 UTM ZONE 4 N, METERS
HORIZONAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

PROJECT No.: 321804	DATE: 8/12/2024	FIGURE: 2-1C
P.M.: S.B.	DRAWN: J.C.	

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1 INCH

ENVIRONMENTAL ASSESSMENT FOR CONSTRUCTION OF NEW CONSOLIDATED BASE SUPPORT FACILITY, BASE OPERATIONS FACILITIES, AND BASE LIVING QUARTERS

WAKE ISLAND, UNITED STATES

PROPOSED BASE OPS FACILITY

Notes

1. For conceptual purposes only. All locations are approximate.

References

1. Satellite imagery source: USACE, 2023. Satellite imagery from DigitalGlobe (WV2; 47-cm resolution, 06/17/2019).
2. Proposed Base Ops features sourced from 611 Civil Engineer Squadron (CES)/Civil, Environmental and Infrastructure Engineering Element (CEIE). 2021. Air Force Forms 813 and 814, *Request for Environmental Impact Analysis: Construct New Base Operations and Base Support Facilities and Base Living Quarters at WIA*. 13 December.

WGS 1984 UTM ZONE 4 N, METERS

HORIZONTAL DATUM: WGS 1984 | VERTICAL DATUM: NAVD88

200 100 0 200 400

Feet

PROJECT No.: 321804	DATE: 6/20/2023	FIGURE:
P.M.: S.B.	DRAWN: J.C.	2-1D

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2.4.2 Wake Island Marine Environment

The marine environment at Wake Atoll includes the ocean and the shallow lagoon surrounded by Peale, Wake, and Wilkes Islands. The lagoon opens to the ocean on its northwestern side. A coral reef surrounds the atoll. Outside of the coral reef, ocean depths increase sharply into deep water habitats.

The atoll includes intertidal zones with the following three substrate types:

1. *Fringing reefs* surround the atoll. Fringing reefs are composed primarily of rocky or coral substrate. These areas are subject to tidal and ocean currents that remove finer sediments.
2. *Patch reefs* are located between the fringing reefs and the lagoon and in a few small areas within the lagoon. Patch reefs are predominantly composed of coral rubble and a moderate amount of sand. Water depth (6-10 feet) is generally greater than the fringing reef.
3. *Sand habitat* is the primary component of the intertidal lagoon. This habitat has a low percentage of rocky or coral substrate and moderate coral rubble. Fine sediments dominate the substrate at depths of 10-12 feet in the western section to only a few inches in the eastern portion. Turbidity is often high in the eastern lagoon due to the preponderance of sand and fine sediments. Tidal pools are present at low tide in the eastern and southern sections of the lagoon.

In 1962, Executive Order 11048 designated the Secretary of the Interior responsible for all executive, legislative, and judicial authority necessary for administration of the atoll.

In 1972, a Memorandum of Agreement between the Secretary of the Air Force and the Secretary of the Interior granted USAF civil administration of the atoll (although ownership stayed with the Department of the Interior).

In 1976, the MSA extended U.S. jurisdiction over waters off its coast to 200 nautical miles and established eight regional fishery management councils to govern the management and conservation of fisheries in federal waters. The Western Pacific Regional Fishery Management Council has authority over fisheries seaward of state/territorial waters of Hawaiʻi and the U.S. Pacific Islands, including Wake Island.

On 6 January 2009, Presidential Proclamation 8336 established the Pacific Remote Islands Marine National Monument (PRIMNM). The Monument encompasses seven islands and atolls: Baker, Howland, and Jarvis Islands; Johnston, Wake, and Palmyra Atolls; and Kingman Reef; and includes the waters and submerged lands of the Pacific Remote Islands to 50 nautical miles. Presidential Proclamation 8336 prohibits commercial fishing within the Monument, but gives the Secretary of Commerce, through NOAA, primary responsibility for managing fishery-related activities 12 to 50 nautical miles from the islands.

On 31 August 2016, Secretary of the Interior Order 3284, Amendment Number (No.) 1 assigned the Director of the Interior to manage the waters and the submerged lands of the PRIMNM and its expansion as a unit of the National Wildlife Refuge System (Wake Atoll National Wildlife Refuge). The Director shall not commence management of the emergent lands at Wake Island, and the Department of the Air Force shall continue to manage such emergent lands according to the terms and conditions of the 1972 Agreement between the Secretary of the Air Force and the Secretary of the Interior unless and until such Agreement is terminated.

On 25 September 2014, Presidential Proclamation 9173 extended the PRIMNM boundaries at Wake Atoll (and subsequently Wake Atoll National Wildlife Refuge), Jarvis Island, and Johnston Atoll to 200 nautical miles.

On 17 April 2023, at the direction of the President, NOAA's Office of National Marine Sanctuaries (ONMS) issued a Notice of Intent to Conduct Scoping and to Prepare an Environmental Impact Statement (EIS) for the Proposed Designation of a National Marine Sanctuary for the Pacific Remote Islands. The proposed national marine sanctuary would include the marine areas within the existing PRIMNM as well as currently unprotected submerged lands and waters to the full extent of the U.S. Exclusive Economic Zone, an area totaling about 770,000 square miles. At the time of this analysis, ONMS is reviewing public comments and preparing a draft management plan, EIS, proposed regulations, and proposed boundaries.

2.4.3 Wake Island Hydrology

Due to Wake Atoll’s small area, flat topography, and substrate composition; groundwater resources are limited. Shallow, brackish groundwater lenses occur in the highly permeable sands. Any fresh rainwater that infiltrates into the permeable substrate is less dense than the underlying brackish groundwater and remains segregated on top of the brackish water. Freshwater runoff in developed areas (runways, rooftops, roadways, etc.) tends to drain rapidly into the lagoon or the Pacific Ocean. As a result, groundwater on the atoll is brackish and non-potable (USAF 2023a).

The lagoon covers an area of approximately 1.5 square miles. The lagoon is shallow and averages 10 feet in depth, but ranges from 1 to 12 feet in depth depending on the tidal condition. Depths at the mouth of the lagoon are around 15 feet. The lagoon includes an intertidal zone of reefs with rocky or coral substrate and large areas of sandy bottom. Water in the lagoon is often turbid due to the ocean and tidal currents mixing the sediments (USAF 2023a).

Deep water surrounds the entire atoll. Inside the lagoon, the mean tide range is approximately 1.5 feet. Low tides have a stand of 2-3 hours. Tidal flow through the lagoon has been disrupted as the result of historical activities conducted at the atoll. The solid fill causeway connecting Wake with Wilkes Islands completely obstructs any natural flow. Re-contouring of the shoreline has likely caused the currents within the lagoon to shift. Based on *Notes on the Geography and Natural History of Wake Island* compiled by E.H. Bryan in 1959, the Tangier Expedition in 1923 recorded depths of up to 15 feet in the lagoon (USAF 2023a).

Individuals stationed at Wake Island in the 1970s and 1980s indicated that large expanses of living coral occurred in the lagoon, along with a diverse assemblage of invertebrates and fishes (USAF 2008a, as cited in USAF 2023a); the lagoon can no longer be qualitatively described in such a manner. Bathymetric surveys of the lagoon have not been conducted. Sparse soundings were conducted by the NOAA National Geophysical Data Center (NGDC). The NGDC developed digital elevation and bathymetry models for Wake Atoll in 2009. Based on the modeling, the lagoon ranges in depth from less than 1.5 feet to about 6.5 feet in the eastern half of the lagoon and from approximately 6.5 feet to over 15 feet at its mouth in the western half of the lagoon (USAF 2023a).

3.0 DESCRIPTION OF THE ESA SPECIES

Two species of federally listed sea turtles and three species of federally listed corals are known to occur in the action area. The status of each species, including critical habitat, is described below.

Critical habitat is defined in Section 3 of the ESA as: (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination that such areas are essential for the conservation of the species. "Conservation" is defined in the ESA as the use of all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary.

3.1 Hawksbill Sea Turtle (*Eretmochelys imbricata*)

Hawksbill sea turtles (HST) inhabit nearshore habitats in all of the world's major oceans. Although life expectancy remains unconfirmed, they are long-lived and estimated to live 50 to 60 years. The nesting season varies by location, but in most places occurs between April and November of each year. Hawksbills typically nest at night on small and isolated "pocket" beaches, with little or no sand and a rocky approach, usually high up on the beach under or in vegetation. After about two months incubating in the warm sand, the eggs hatch, and the hatchlings make their way to the water (NOAA 2023c).

Threats to HST include fishing bycatch, loss of habitat, vessel strikes, pollution, climate change, and disease. HST have been documented in the waters surrounding WIA (NOAA 2023c). In 2020, a HST estimated to be 18 inches in length was observed in 10 feet of water just offshore of the fuel storage tanks on Wilkes Island feeding on algae (NOAA 2022, as cited in USAF 2022).

3.1.1 Critical Habitat

NOAA-NMFS has designated critical habitat for the endangered HST to include coastal waters surrounding Mona and Monito Islands, Puerto Rico (NOAA 1998).

3.2 Green Sea Turtle (*Chelonia mydas*) (Central West Pacific DPS)

The green sea turtle (GST) is the largest hard-shelled sea turtle. This species is unique among sea turtles in that they are herbivores, eating mostly seagrasses and algae, a diet which gives their fat the greenish color for which they are named. GST are found throughout the world, nesting in over 80 countries and living in the coastal areas of more than 140 countries. Historically, GST were exploited for their fat, meat, and eggs, causing global population declines. GST, like all sea turtles, are reptiles, and must surface to breathe and lay their eggs on land. GST migrate hundreds to thousands of kilometers each way between their foraging grounds and nesting beaches. They are solitary, night-time nesters (NOAA 2023a).

The life history of GST involves a series of developmental stages from hatchling to adult. Like HST, GST dig nests on beaches and lay eggs during the night. Eggs incubate for about 2 months. After emerging from the nest, hatchlings swim to offshore areas, where they live for several years in pelagic (open ocean) habitats. Juveniles eventually leave this habitat and travel to nearshore foraging grounds in shallow coastal habitats, where they mature to adulthood and spend the remainder of their lives. Adults migrate every 2 to 5 years from their coastal foraging areas to the waters off the nesting beaches where they originally hatched to reproduce. Their diet mainly consists of algae and seagrasses, though they may also forage on sponges, invertebrates, and discarded fish. Prior to traveling to nearshore foraging areas, pelagic juveniles forage on plant and animal life found in oceanic drift communities, such as pelagic *Sargassum* (brown microalgae) communities (NOAA 2023a).

Threats to GST include fishing bycatch, loss of habitat, vessel strikes, pollution, climate change, and disease. WIA has documented occasional sightings of GST in the waters surrounding the atoll, though there has been no documented evidence of GST nesting on the beaches of WIA (USAF 2023a).

3.2.1 Critical Habitat

The GST has several distinct population segments (DPSs). Wake Atoll is located in the area of the Central West Pacific DPS. There is no designated critical habitat for the GST Central West Pacific DPS (NOAA 2023b).

3.3 Coral Species

Three species of coral are known to occur in the action area, including *Acropora speciosa*, *Acropora retusa*, and *Acropora globiceps*.

3.3.1 *Acropora speciosa*

Acropora speciosa was likely distributed from Indonesia to the Marshall Islands in the western and central Pacific. It also occurs in the Maldives in the Indian Ocean and in at least one site in French Polynesia. In the U.S., it might be found in the Pacific Remote Islands and American Samoa. Colonies of *Acropora speciosa* form thick cushions or bottlebrush branches. Colonies are cream or light brown in color with delicately colored branch tips. Threats to the species include climate change (including ocean warming and ocean acidification), disease, habitat degradation, land-based sources of pollution, small population size, and unsustainable fishing (NOAA 2023d).

3.3.2 *Acropora retusa*

Acropora retusa is found in U.S. waters in Guam, American Samoa, and the Pacific Remote Islands. Colonies are made up of flat plates with short, thick, finger-like branches that appear rough and spiky due to the variable length of radial corallites. Colonies are typically brown or green in color. Threats to the species include climate change (including ocean warming and ocean acidification), disease, habitat degradation, land-based sources of pollution, small population size, and unsustainable fishing practices (NOAA 2023e).

3.3.3 *Acropora globiceps*

Acropora globiceps is found in the oceanic central and western Pacific Ocean and the central Indo-Pacific. Within the U.S., it is known to occur in Guam, the Commonwealth of the Northern Mariana Islands, American Samoa, and the Pacific Remote Islands. Colonies of *Acropora globiceps* coral have finger-like branches. The size and appearance of branches depend on the degree of exposure to wave action but are always closely compacted. Threats include climate change (including ocean warming and ocean acidification), diseases, habitat degradation, land-based sources of pollution, small population size, and unsustainable fishing (NOAA 2023f).

3.3.4 Coral Critical Habitat

In June 2015, NOAA sent a notification to the Assistant Secretary of the Air Force stating that Wake Atoll was currently under consideration for critical habitat designation for the potential presence of three listed coral species and/or essential features of their habitat (79 Federal Register 53852 2014). The 611 CES/CEIE and the USFWS collaborated in July and August 2016 to conduct a shallow coral survey at Wake Island (USAF Project No. YGFZOS167777). USFWS confirmed listed coral were identified in multiple locations along the southern portion of the atoll. Based on the survey results, the 611 CES/CEIE has developed a Coral Conservation Action Plan that identifies and summarizes a series of terrestrial- and marine-based actions that benefit these coral species and their habitats (USAF 2023a).

In November 2020, NOAA-NMFS proposed to designate critical habitat for the seven threatened corals in U.S. waters in the Indo-Pacific (*Acropora globiceps*, *Acropora jacquelineae*, *Acropora retusa*, *Acropora speciosa*, *Euphyllia paradivisa*, *Isopora crateriformis*, and *Seriatopora aculeata*). Seventeen specific occupied areas containing physical features essential to the conservation of these coral species are being proposed for designation as critical habitat; these areas contain approximately 230 square miles of marine habitat (NOAA 2020). NOAA-NMFS determined that the implementation of the WIA Integrated Natural Resources Management Plan (INRMP) (USAF 2023a) provided a benefit to the habitats of listed coral species within INRMP marine areas on Wake Atoll, which completely encompass all the potential proposed coral critical habitat; thus, in accordance with Section 4(a)(3)(B) of the ESA, the potential proposed coral critical habitat within the INRMP marine areas is ineligible (NMFS 2019).

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4.0 ESA EFFECTS ANALYSIS

In analyzing effects to listed species, the USAF 611 CES considered the proposed action's timing and duration (Section 2.0) as well as the nature of effects. During implementation of the proposed action, listed species may experience effects from increased barge traffic, erosion/sedimentation, contaminant runoff, noise, and exterior lighting.

4.1 Increased Barge Traffic

Food and fuel are delivered to Wake Island via barge several times a year. During implementation of the proposed action, barge traffic will increase as supplies, materials, and waste are transported to and from the island. The capacity of the harbor limits the size of vessels it can receive; therefore, although the frequency of barges entering the harbor will increase, their size, number, and duration of stay will not. For these reasons, the increased barge traffic is not expected to adversely affect listed species or critical habitat.

4.2 Erosion/Sedimentation

Substrate and soil disturbance during project implementation, both from heavy equipment and operating vehicles on unpaved roads, could result in erosion, sedimentation into local surface water conveyances, and water quality degradation. Murky water prevents natural vegetation from growing in water, and at high enough concentrations suspended sediment clogs fish gills, reducing resistance to disease, lowering growth rates, and affecting fish egg and larvae development (Mid-America Regional Council [MARC] 2023). The potential effects to listed species are:

Sea turtles may experience decreased visibility leading to difficulty locating food or detecting predators and potentially nest destruction (USFWS 2022); decreased availability of food for GST, whose diet consists mainly of algae and seagrasses (NOAA 2023a), and HST, which is omnivorous and may feed on fish or plants (NOAA 2023c). Lethal levels of sediment for fish, determined through laboratory experimentation over different exposure times, typically range from hundreds to hundreds of thousands of milligrams per liter (mg/L) suspended sediment, whereas sublethal effects are typically manifest in the tens to hundreds of mg/L suspended sediment (DFO 2000).

Coral species may be affected if photosynthesizing phytoplankton becomes scarce, which would in turn decrease the available sustenance for the zooplankton that coral feed upon. As filter-feeders, sediment itself could interfere with food uptake (Fisheries and Oceans Canada [DFO] 2000). Coral species begin to experience adverse effects from suspended sediment at an exposure level as low as 10 mg/L for juveniles (reduced growth rates) and 3.2 mg/L for adults (bleaching and tissue mortality; Tuttle and Donahue 2022).

4.3 Contaminant Runoff

As stormwater runoff flows, it can collect and transports pollutants such as petroleum products and hazardous substances (lead, asbestos, etc.) to the ocean. The potential effects to listed species at high enough concentrations are reduced survival, impaired reproduction, reduced growth, and high bioconcentration.

Quantitative data on the effects of pollutants on sea turtles is limited, and monitoring health indicators in sea turtles is difficult due to the limited ability to control for external influences. Toxicity varies by developmental stage, dietary factors, physiology, and biochemical functions (Arienzo 2023).

A quantitative synthesis of 2,706 study cases published after 2010 indicates that the toxicity thresholds of chemical pollutants for tropical reef-building corals (including those in the *Acropora* family) are as follows (Ouédraogo et al. 2023):

- **Metals:** 0.65 micrograms per liter (µg/L) – 60 mg/L
- **Hydrocarbons:** 0.165 µg/L-34.2 mg/L
- **Pesticides:** 1 nanogram per liter (ng/L) – 333 µg/L
- **UV Filter:** 0.165 µg/L – 100 µg/L
- **Dispersants:** 1 mg/L – 5 mg/L
- **Detergents:** 0.75 mg/L – 1 mg/L

4.4 Noise

Noise derived from the proposed action will include aircraft operations, vehicle traffic, generators, construction, demolition, and miscellaneous operations and maintenance. Depending on the sound source, duration, and location, the potential effects to listed species are temporary or permanent hearing loss, stress response, displacement from habitat, and disruptive feeding, breeding, and communication behaviors (NOAA 2023g). NOAA-NMFS has established acoustic thresholds for listed marine mammals, fishes, and sea turtles for different categories of sound sources (NMFS 2023). No acoustic thresholds for corals could be identified.

NOAA-NMFS characterizes sound sources in terms of behavioral disturbance and temporary and permanent threshold shifts (NMFS 2018, 2023):

- **Behavioral Disturbance (BD):** The sound level at which a temporary, reversible change in an individual's behavior is observed (e.g., avoidance).
- **Temporary Threshold Shift (TTS):** The sound level at which a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level is observed (i.e., temporary hearing loss).
- **Permanent Threshold Shift (PTS):** The sound level at which a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level is observed (i.e., permanent hearing loss).

There are separate thresholds for impulsive (e.g., explosives, impact pile driving) and non-impulsive (e.g., drilling, vibratory pile driving) noise sources; however, impulsive noise sources can be discounted from this evaluation because the noise emissions from the proposed action will be non-impulsive in nature, as no impact devices will be required. The non-impulsive acoustic thresholds for sea turtles are (NMFS 2023):

- **BD Onset:** Root-mean-square peak noise level of 175 decibels (dB)
- **TTS Onset:** 24-hour weighted cumulative noise level of 200 dB
- **PTS Onset:** 24-hour weighted cumulative noise level of 220 dB

To determine the potential noise impacts from the proposed action, construction noise levels at the air/water interface were estimated using the U.S. Federal Highway Administration (FHWA) Road Noise Construction Model (RCNM) (FHWA 2006) for the nearest point between construction activities and the mean high tide line of marine waters. Based on this model, the following noise levels will be experienced at the air/water interface:

- Peak noise level of 71.6 A-weighted decibels (dBA)
- 24-hour weighted cumulative noise level of 72.8 dBA

These noise levels are well below the 175 dB threshold for BD onset in sea turtles and will be even lower at the soil/water interface due to the sound-absorbing nature of the semi-consolidated sands at Wake Island.

To verify that there is no potential for adverse noise impacts from the proposed action, the higher of the two RCNM values (72.8 dBA) was entered into the NMFS Optional User Spreadsheet Tool (NMFS 2020) to estimate isopleths (noise contours) associated with PTS onset thresholds. As this tool was designed for marine mammals, it does not have built-in threshold values for sea turtles; therefore, the PTS threshold for high frequency (HF) cetaceans (173 dB) was used as a conservative indicator, as it is lower than the 175-dB threshold for BD onset in sea turtles. The model resulted in a PTS Isopleth to Threshold distance of 0 meters, indicating that noise levels will be less than 173 dB at the point of generation (in this case, the point of energy transfer from air/soil to water). This result supports the conclusion that noise resulting from the proposed action will not adversely impact listed sea turtles.

4.5 Exterior Lighting

Unmitigated exterior lighting has the potential to affect airfield operations and/or protected wildlife. Although there are currently no documented incidents of sea turtle nesting or *take* of sea turtles due to lighting, WIA shorelines can be categorized as potential sea turtle nesting habitat. The potential effects to sea turtles from artificial light sources on a nesting beach are deterrence of adult female turtles from exiting the water to lay eggs on the beach, abandonment of nesting attempts, disorientation of adult females, and disruption of the natural behavior of returning to the sea after nesting. Additionally, artificial light disorients hatchlings that use light cues to find their way to the sea, making them more vulnerable to predation, exhaustion, and desiccation. Artificial light may also disturb basking turtles (USAF 2023a).

4.6 Critical Habitat

All areas on WIA have been precluded from designation as critical habitat due to the conservation measures included in the 2023 WIA INRMP (USAF 2023a) and USAF 611 CES management actions, which conserve habitat and provide benefits to listed species.

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5.0 ESSENTIAL FISH HABITAT DESIGNATION

This section addresses the effects of the proposed action to EFH. The marine water column from the surface to a depth of 1,000 meters from the shoreline to the outer boundary of the Exclusive Economic Zone (the zone where the U.S. and other coastal nations have jurisdiction over natural resources; 230 miles), and the seafloor from the shoreline out to a depth of 100 meters around Wake Island have been designated as EFH (Western Pacific Regional Fishery Management Council 2009a, 2009b). As such, the water column and bottom of the nearshore Pacific Ocean surrounding Wake Atoll are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council Fishery Ecosystem Plans for Pacific Pelagic Fisheries of the Western Pacific Region and Pacific Remote Island Areas. The MUS and life stages found in these waters include: eggs, larvae, juveniles, and adults of bottom fish MUS; eggs, larvae, juveniles, and adults of Crustacean MUS; and eggs, larvae, juveniles, and adults of pelagic MUS. Specific types of habitat considered as EFH include coral reef, patch reef, hard substrate, artificial substrate, seagrass beds, soft substrate, mangrove, lagoon, estuarine, surge zone, deep-slope terraces and pelagic/open ocean.

The waters and submerged lands off Wake Island's shore (i.e., the water column and bottom) support EFH and various life stages associated with a coral reef ecosystem. The atoll lagoon supports a large population of fish, while the reefs contain a diverse assemblage of reef fish.

5.1 Essential Fish Habitat Effects Analysis

The MSA defines procedures for coordination and consultation and provides recommendations to promote protection of EFH through a review of federal actions that may adversely affect EFH. An adverse effect is any impact that reduces quality and/or quantity of EFH and may include direct or indirect physical, chemical, or biological alterations to the water or substrate; and loss of or injury to benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH.

The potential effects to EFH from the proposed action include:

- Exposure to increased barge traffic
- Exposure to suspended sediment
- Exposure to contaminant runoff
- Exposure to demolition and construction noise

As described in Section 4.1, barge traffic is expected to increase during implementation of the proposed action. Because the size, number, and duration of the vessels' anchorage will not change, this is not expected to adversely affect EFH.

Best management practices (BMPs) will be required for dust control and offsite migration of sediments or contaminants. These include:

- Watering unpaved roads to prevent dust agitation.
- Employing low impact development strategies as prescribed by Unified Facilities Criteria 3-210-10, *Low Impact Development*.
- Strategic installation of core logs, absorbent socks, silt curtain or similar items to capture overland stormflow that may transport sediments in areas that are within 50 feet of open water until the roads have been compacted.

- Maintaining existing vegetated buffers between construction areas and open water.
- Application for coverage under an Environmental Protection Agency Construction General Permit and conducting activities in accordance with the permit and the installation Storm Water Pollution Prevention Plan.

As noted in Section 4.4, the estimated construction noise levels at the air/water interface are a root-mean-square peak noise level of 71.6 dBA and a 24-hour weighted cumulative noise level of 72.8 dBA (FHWA 2006). The non-impulsive acoustic thresholds for fishes are (NMFS 2023):

- **BD Onset:** Root-mean-square peak noise level of 150 dB
- **Physical Injury Onset:** 12-hour weighted cumulative noise level of 183 dB

These thresholds are well above the highest estimated construction noise level (72.8 dBA); therefore, the proposed action will not adversely impact EFH.

5.2 Essential Fish Habitat Effects Determination

The USAF 611 CES has determined that effects from the proposed action are discountable and will not adversely affect the quality of EFH.

6.0 CONSERVATION MEASURES

The following avoidance, minimization, and conservation measures are consistent with the 2023 WIA INRMP and are proposed to minimize stressors to federally listed species and avoid impacts to EFH:

- The contractor shall maintain a minimum of 100-foot vegetative buffers between project areas and open water. Any removal of vegetation shall be included in the workplan. Removal of vegetative buffers shall be pre-approved by USAF 611 CES Natural Resources.
- Spill response procedures specified in the WIA Spill Prevention, Control, and Countermeasures Plan and all required materials shall be in place during project implementation.
- Silt fencing shall be placed around project footprints, staging areas, and near the shoreline to minimize runoff of contaminants and particulate matter into the marine environment.
- All lighting must adhere to Appendix O (Standards for Exterior Lighting at Wake Island Atoll) of the 2023 INRMP (USAF 2023a). All new construction or light replacement shall incorporate wildlife-friendly lighting and shielding into the project design as mission and safety allow. Minimization measures remain a priority for all artificial light sources that are visible to sea turtle nesting habitat (USAF 2023a).
- No night-time work is planned but if required, shall be pre-approved with 611 CES Natural Resources.
- All new window and door construction, replacement, and retrofitting will include window tinting with transmittance values less than or equal to 30% (inside to out) and blackout curtains (USAF 2023a).
- Biological monitoring shall be conducted by a 611 CES approved Biological Monitor/Protected Species Observer for the duration of the proposed action(s).
- USAF and 611 CES Natural Resources shall be notified of any *take* of listed species, environmental issues, contamination, spills, concerns, and non-compliance immediately. All *take* of listed species will be reported to USFWS/NMFS within 24 hours.
- Project implementation will follow the USFWS Pacific Islands Fish and Wildlife Office general project design guidelines for GST and HST (USFWS 2022).
- All project work shall cease if any federally listed threatened or endangered species are present within 100 feet of the action. The project manager will document the incident, notify 611 CES Natural Resources, and wait for the listed species to leave the area on its own, or await further instruction from USFWS/NMFS.
- The contractor shall ensure preparation of all permits and regulatory/consultation documents and submit the finalized drafts to the 611 CES Natural Resources Program. This includes, but is not limited to, applying for and obtaining a USFWS Special Use Permit for use of a refuge or marine national monument to conduct work in the PRIMNM and the proposed National Marine Sanctuary.
- Compliance with all biosecurity measures and conditions of the USFWS Special Use Permit is required.
- Compliance with the WIA INRMP (USAF 2023a) is required.
- Compliance with the WIA Biosecurity Management Plan (PRSC 2015) is required.

- Additional BMPs, restrictions, modifications, studies, testing, and inspections may be required at the discretion of USAF at any time.

7.0 MONITORING AND REPORTING PLAN

7.1 Biological Monitor

The construction contractor will be required to have a qualified biological monitor (BIMO) onsite during project activities. The primary responsibility of the BIMO is to minimize incidental *take*[1] of ESA listed species[2] and Migratory Bird Treaty Act (MBTA)[3] species. Listed species include, but are not limited to, HST, GST, and coral (*A. speciosa, A. retusa, A. globiceps*). MBTA species include, but are not limited to, black noddy (*Anous minutus*), Laysan albatross (*Phoebastria immutabilis*), northern pintail (*Anas acuta*), Pacific golden-plover (*Pluvialis fulva*), red-tailed tropicbird (*Phaethon rubricauda*), ruddy turnstone (*Arenaria interpres*), and white tern (*Gygis alba*). Table 7-1 is a reference for WIA species but is not all-inclusive.

The BIMO must be onsite for the duration of the project to minimize the likelihood of *take* in the action area[4]. If *take* of listed species occurs, work must stop within 100 feet of the incident and 611 CES will be notified immediately. USFWS/NOAA-NMFS will be notified by 611 CES to determine the next steps. The BIMO will immediately report all *take* of listed species by phone call and email within 24 hours. All *take* incident(s) will be included in the monthly report.

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[1] **Take** – To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct [ESA 3(19)]. **Harm** is further defined to mean an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 Code of Federal Regulations [CFR 17.3]). **Harass** is defined as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3).

[2] **Listed Species** – A species, subspecies, or distinct vertebrate population segment that has been added to the federal lists of Endangered and Threatened Wildlife and Plants as they appear in 50 CFR 17.11 and 17.12.

[3] **The Migratory Bird Treaty Act** (16 United States Code 703–712) prohibits the *take* (including killing, capturing, selling, trading, and transport) of protected migratory birds, or the parts, nests, or eggs of such birds, without prior authorization by the Department of Interior, USFWS.

[4] **Action Area** – All areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02).

Table 7-1 Bird Species on Wake Island Airfield

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS
Black kite	*Milvus migrans*	MBTA
Sea eagle	*Haliaeetus albicilla*	MBTA
Common goldeneye	*Bucephala clangula*	MBTA
Northern pintail	*Anas acuta*	MBTA
Tufted duck	*Aythya fuligula*	MBTA
Cattle egret	*Bubulcus ibis*	MBTA
Pacific reef heron	*Egretta sacra*	MBTA
Lesser sand plover	*Charadrius mongolus*	MBTA
Pacific golden-plover	*Pluvialis fulva*	MBTA
Black-footed albatross	*Phoebastria nigripes*	MBTA
Laysan albatross	*Phoebastria immutabilis*	MBTA
Great frigatebird	*Fregata minor*	MBTA
Lesser frigatebird	*Fregata ariel*	MBTA
Glaucous-winged gull	*Larus glaucescens*	MBTA
Laughing gull	*Leucophaeus atricilla*	MBTA
Red-tailed tropicbird	*Phaethon rubricauda*	MBTA
White-tailed tropicbird	*Phaethon lepturus*	MBTA
Black-winged petrel	*Pterodroma nigripennis*	MBTA
Christmas sheerwater	*Puffinus nativitatis*	MBTA
Newell's shearwater	*Puffinus auricularis newelli*	FT, MBTA
Sooty shearwater	*Ardenna grisea*	MBTA
Wedge-tailed shearwater	*Ardenna pacifica*	MBTA
Bristle-thighed curlew	*Numenius tahitiensis*	MBTA
Common sandpiper	*Actitis hypoleucos*	MBTA
Common snipe	*Gallinago gallinago*	MBTA
Dunlin	*Calidris alpina*	MBTA
Gray-tailed tattler	*Tringa brevipes*	MBTA
Greater yellowlegs	*Tringa melanoleuca*	MBTA
Long-billed dowitcher	*Limnodromus scolopaceus*	MBTA
Pectoral sandpiper	*Calidris melanotos*	MBTA
Ruddy turnstone	*Arenaria interpres*	MBTA
Sanderling	*Calidris alba*	MBTA
Sharp-tailed sandpiper	*Calidris acuminata*	MBTA
Wandering tattler	*Tringa incana*	MBTA
Whimbrel	*Numenius phaeopus*	MBTA
Black noddy	*Anous minutus*	MBTA
Brown noddy	*Anous stolidus*	MBTA
Gray-backed tern	*Onychoprion lunatus*	MBTA
Sooty tern	*Onychoprion fuscatus*	MBTA

Table 7-1 Bird Species on Wake Island Airfield

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS
White tern	*Gygis alba*	MBTA
Short-eared owl	*Asio flammeus*	MBTA
Brown booby	*Sula leucogaster*	MBTA
Masked booby	*Sula dactylatra*	MBTA
Nazca booby	*Sula granti*	MBTA
Red-footed booby	*Sula sula*	MBTA

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: USAF 2023a.

7.2 Duties/Responsibilities

The BIMO will have the following duties:

- The BIMO will receive a briefing from 611 CES Natural Resources staff to review the duties and responsibilities of the BIMO prior to project implementation.
- The BIMO will conduct surveys for protected species and nests prior to project initiation and daily. The daily survey will include BIMO observations under equipment, vehicles, project materials, etc. The BIMO will collect band data from all applicable species in the project area daily and include the data in monthly reports.
- Surveys, observations, and monitoring of the project area will occur daily. All data and information collected will be included in a monthly report.
- The BIMO will develop a species guide pamphlet that includes photos and descriptions of the protected species likely to be encountered at WIA. The species guide will include reporting instructions, equipment check procedures, speed limits, definition of *take*, and other relevant information. The BIMO will be responsible for printing and distributing the species guide pamphlet and will produce additional copies as needed to ensure all personnel have a legible copy. A preliminary draft of the species guide will be submitted electronically to the 611 CES and USFWS for review a minimum of 90 days prior to project implementation. The 611 CES and USFWS will have 30 days to review and provide comments/information. The BIMO will incorporate all comments/information and provide the 611 CES a final version a minimum of 30 days prior to project implementation.
- The BIMO will conduct an onsite pre-construction briefing to all project personnel. The briefing will occur prior to project implementation and as needed for new personnel assigned to work at the site.
- The BIMO will inspect active project areas scheduled for vegetation removal/clearing to mitigate *take* of protected species and nests and ensure BMPs and conservation measures are followed. The BIMO will conduct regular patrols and make visual inspections of project areas, laydown areas, and action areas during the entire construction period and project operations.
- If listed species are encountered, actions within 100 feet will immediately cease and equipment/personnel will be moved at least 100 feet away. The 611 CES Natural Resources Manager will be notified immediately for further instructions.
- USAF reserves the right to inspect BIMO performance, review data, and request additional information at any time.

7.3 Reporting

- The BIMO will submit reports electronically to the Contracting Officer and 611 CES Natural Resources on the first Monday of every month. Reports will include, but not be limited to, monitoring data, survey results, nesting activity, avian band data, ESA or MBTA related issues, and maps of survey locations, species locations, incidents, photos, etc. The 611 CES will provide comments on reports within 14 days. The BIMO will incorporate all comments/information into reports and resubmit within 14 days. The 611 CES reserves the right to request additional data, documentation, maps, reports, or other information if required.
- Circumstances that warrant immediate notification to the 611 CES include, but are not limited to:
  - *Take* of protected species, nests, and eggs
  - Violation(s) of federal, state, and local laws
  - Protected species within 100 feet of a project area or activity
  - Spills or environmental contamination

7.4 Minimum Professional Qualifications for the Biological Monitor

Personnel fulfilling BIMO duties must meet minimum qualifications and be approved by the 611 CES. The following are minimum professional qualifications required for the BIMO position:

A 4-year college degree related to natural resource management, wildlife biology, ornithology, or closely related discipline plus 1 year of field experience with wildlife research, monitoring, or surveys; OR equivalent experience (minimum 3 years of field experience with avian research, monitoring, surveys, etc.).

Demonstrated skills and knowledge of scientific and standard survey methods, data management, and identification of protected species. The BIMO position also requires the use of personal protective equipment and the ability to work around heavy equipment, active construction areas, and loud noises; navigate difficult terrain; stand for extended periods; and perform duties in adverse weather conditions.

8.0 CONCLUSION

For this BE, the 611 CES examined the potential impacts from increased barge traffic, substrate and soil disturbance, stormwater runoff, noise, and exterior lighting on two federally listed sea turtles and three federally listed coral species.

Based on the impact analysis and with implementation of the proposed avoidance and minimization measures, the 611 CES has made the determination that the proposed actions **may affect, but are not likely to adversely affect** the HST (*Eretmochelys imbricata*), Central West Pacific GST (*Chelonia mydas*), *Acropora speciosa* coral, *Acropora retusa* coral, and *Acropora globiceps* coral. There will be no impact to designated critical habitat as all areas on WIA have been precluded from designation as critical habitat due to the conservation measures (USAF 2023b) and 611 CES management actions to conserve habitat and provide benefits to listed species. USAF 611 CES requests concurrence with these determinations.

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Attachment 1

Biological Monitor Report

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Biological Monitor Report
USAF 611 CES

Location:		Date:
Observer:		Time:
Wind (mph)/Direction:	Cloud Cover (%):	Precipitation:

Species	Notes

Notes:

Maps:

Photos:

Contact Information:

Name/Title	Phone Number/Email

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APPENDIX E
NOISE ANALYSIS REPORT

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Noise Analysis Technical Report for Construction of New Consolidated Base Support Facility, Base Operations Facility, Base Living Quarters, and Aircraft Parking Apron at Wake Island Airfield, United States

Date:	20 August 2024
Revision:	Final
Contract:	W911KB18D0016, Task Order W911KB22F0148
Project:	Environmental Assessment for Construction of New Consolidated Base Support Facility, Base Operations Facility, Base Living Quarters, and Aircraft Parking Apron at Wake Island Airfield, United States
To:	Heidi Long, PM, USACE Alaska District; Sean Palmer, 611 CEN/CEIE
From:	Steve Becker, Brice Environmental Services Corporation
Attachments:	Attachment E-1 – Road Construction Noise Model Scenario Reports

Brice Environmental Services Corporation (Brice) is completing an Environmental Assessment (EA) for four planned future projects at Wake Island Airfield (WIA) for the U.S. Air Force (USAF) 611 Civil Engineer Squadron (CES) under U.S. Army Corps of Engineers (USACE) Alaska District Contract W911KB18D0016, Delivery Order W911KB22F0148. The USAF Environmental Impact Analysis Process (EIAP) requires a description of baseline noise levels and an evaluation of potential direct, indirect, and cumulative noise impacts resulting from the Proposed Action and identified alternatives, including the No Action Alternative. This Technical Memorandum summarizes that analysis, the findings of which are incorporated into the EA.

1.0 PROPOSED ACTION

The Proposed Action consists of the construction of a new Consolidated Base Support Facility (CSF), Base Operations (Base Ops) Facility, Base Living Quarters, and aircraft parking apron. This would involve construction of 22 new buildings; demolition of 49 dilapidated Cold War-era buildings; relocation of memorials; and rerouting Wake Avenue. These activities are described in more detail below.

1.1 Construct Consolidated Base Support Facility

A new CSF would be constructed at the former golf course north of WIA, to include a standalone dining facility (DFAC) with centralized dry and cold food storage areas as well as kitchen and serving areas; and separate consolidated facility that includes a fitness center, medical clinic, billeting office, and base laundry. A generator building housing a new generator would also be constructed, as well as associated utilities, roads, sidewalks, parking, picnic pavilions, and other site improvements. Building (B) 1103 (base laundry), B1104 (DFAC), B1105 (cold storage), B1107 (cold storage), B1128 (dormitory/physical fitness center) and B2100 (former golf course clubhouse) would be demolished as part of this project.

1.2 Construct Base Operations Facility

This project would involve demolition of B106 (defunct chapel), B1502 (existing Base Ops Facility), and B1503 (generator building, including the existing generator); and the construction of a new facility approximately 175 feet east and 300 feet north of the existing facility, to include an associated passenger terminal, USAF and non-USAF administration offices, a postal service center, bank counter, secure areas, air traffic control tower, and generator building housing a new generator, as well as associated utilities, roads, sidewalks, a personally owned vehicle parking lot, and other site improvements. An aerospace ground equipment (AGE) storage area would also be constructed. Memorials would be relocated east of the new Base Ops Facility.

1.3 Construct Base Living Quarters

The existing lodging facilities would be demolished and the new Base Living Quarters would be constructed adjacent to the new CSF in the area of the former golf course (Table 1). In anticipation of future housing demand, the Base Living Quarters area would contain enough space to construct two additional two-story dormitories for added housing capacity.

Table 1 Housing Breakout

TYPE
Permanent Party
Craftsman
Managers/leads
Detachment staff
Company Commander
Transient
Long-term
Short-term
DV

Notes:
For definitions, refer to the Acronyms and Abbreviations section.
Source: PACAF 2022.

This project includes demolition of 20 buildings that are in poor condition and would be excess after construction is complete. Table 2 presents the specific buildings slated for demolition.

Table 2 Building Demolition Associated with New Base Living Quarters Facilities

FACILITY ID	FACILITY NAME	AREA (SF)
B506	Visiting Officer’s Quarters	2,155
B626	Officer’s Quarters	3,063
B921	Airman Dormitory	3,429
B944	Officer’s Quarters	3,185
B1009	Officer’s Quarters Station Manager	2,295
B1010 (officer’s quarters)	Officer’s Quarters	2,295

Table 2 Building Demolition Associated with New Base Living Quarters Facilities

FACILITY ID	FACILITY NAME	AREA (SF)
B1011 (officer's quarters)	Officer's Quarters	2,295
B1012 (officer's quarters)	Officer's Quarters	2,147
B1013 (officer's quarters)	Officer's Quarters	2,335
B1014 (officer's quarters)	Officer's Quarters	2,148
B1015 (officer's quarters)	Officer's Quarters	2,268
B1016 (officer's quarters)	Officer's Quarters	2,295
B1017 (officer's quarters)	Officer's Quarters	2,980
B1018 (officer's quarters)	Officer's Quarters	2,980
B1115 (visiting officer's quarters)	Visiting Officer's Quarters	10,579
B1116 (visiting airman quarters)	Visiting Airman Quarters	6,962
B1117 (airman dormitory)	Airman Dormitory	10,579
B1118 (airman dormitory)	Airman Dormitory	7,131
B1120 (airman dormitory)	Airman Dormitory	7,683
B1128 (visiting airman quarters)	Visiting Airman Quarters	12,918
TOTAL		**91,722**

1.4 Construct Aircraft Parking Apron

The existing parking aprons, Alpha and Bravo, are situated at the eastern end of the airfield. A former aircraft parking apron developed after World War II is located immediately north of Bravo Apron. Construction of a new 1,100,000-square foot (SF) parking apron would allow WIA to accommodate aircraft to taxi in and out and would increase the baseline parking capacity. This project would involve the demolition of approximately 650,000 SF of the former apron as well as the associated infrastructure outlined in Table 3.

Table 3 Building Demolition Associated with New Aircraft Parking Apron

FACILITY ID	FACILITY NAME	AREA (SF)
*B130	Abandoned Facility	Unknown
*B201	Water Pump Station #2	402
*B202	Water Supply (Non-Potable) Building	90
B1401	Base Engineering Administration	3,313
B1402	Supply Warehouse	25,926
B1403	Vehicle Maintenance Shop	9,993
B1406	Vehicle Maintenance Shop	4,056
B1408	Base Engineering Maintenance Shop	6,356
B1409	Base Engineering Maintenance Shop	4,038
B1410	Base Engineering Maintenance Shop	2,811
B1411	Engine Repair Shop	1,047
B1416	Unknown	1,237
*B1504	Old Fire Station	6,895

Table 3 Building Demolition Associated with New Aircraft Parking Apron

FACILITY ID	FACILITY NAME	AREA (SF)
*B1513	Warehouse, Supply and Equipment	5,356
*B1514	Base Engineering Maintenance Shop	4,320
*B1515	Vehicle Fill Stand	77
B1519	Warehouse, Supply and Equipment	19,914
*B1522	Fire Station #2	9,273
*B1550	Fuel Lab #1	435
*B1551	Fuel Lab #2	451
TOTAL		**727,454**

Notes:
*Building within the former aircraft parking apron footprint.

Wake Avenue would be realigned to accommodate the new parking apron and AGE storage area. The existing taxilane at the airfield would be rebuilt and realigned to provide adequate wingtip clearance for aircraft and a seamless, logical extension of Taxilane Alpha (Jacobs 2021).

2.0 EXISTING CONDITIONS AND NO ACTION ALTERNATIVE

2.1 Airspace Noise

2.1.1 Existing Conditions

Airspace noise at WIA is associated with aircraft takeoffs and landings and infrequent missile launches on the southern end of the island. The highest periodic noise levels at WIA are associated with the infrequent missile launches, with single-event maximum noise levels (L_{max}) exceeding 100 dBA (A-weighted decibels) for residential areas of the installation (U.S. Space Force [USSF] 2022). However, launch vehicles generate impulse-type noise for a brief period during the launch, and only a few launches occur per year. Because of their operational maneuvers, the period of the day in which they occur, and their single-event sound level, the various aircraft using WIA are expected to contribute the highest regular Day-Night Average Sound Level (DNL) surrounding the installation.

The arrival and departure frequencies for these aircraft fluctuate based on a variety of conditions such as weather, Department of Defense aircraft temporarily diverted to the island, landing for refueling operations, and passenger flights for personnel shift rotations. However, DNL noise contours for aircraft operations at WIA have not been developed.

2.1.2 No Action Alternative

Existing noise levels from aircraft operations are assumed in this analysis to remain at the same levels as current conditions. While noise levels may alter over time due to changes in the frequency or mixture of aircraft using WIA, these changes would be independent of either the Proposed Action or No Action Alterative and cannot be reasonably predicted at this time.

2.2 Land-Based Noise

2.2.1 Existing Conditions

Land-based noise is derived from aircraft traffic on the ground, vehicle traffic, generators, construction, and operations and maintenance in the nearby industrial area. Natural background sound levels on Wake Island are relatively high because of wind and surf. Background levels can mask the approach of trucks on base roads, and personnel are not always aware of aircraft landings. No measurements of ambient sound levels are known to be available (USSF 2022); however, in past EAs, daytime and evening baselines of 60 to 65 dBA and nighttime baselines of 45 dBA have been assumed (USAF 2009 as cited in USDA 2021).

2.2.2 No Action Alternative

Construction and Demolition Impacts

Under the No Action Alternative, the noise from demolition of existing facilities and construction of new facilities under the Proposed Action would not occur. This analysis assumes that independent construction and demolition projects will be required to conduct similar noise analyses and that mitigation measures would be incorporated to ensure that noise impacts remain at less-than-significant levels.

Long-Term Impacts

Existing land-based noise levels and patterns at WIA are assumed to remain the same as existing conditions under the No Action Alternative. While noise levels and patterns may alter over time due to changes in land or facility use, these changes would be independent of the No Action Alternative and cannot be reasonably predicted at this time.

3.0 NOISE LIMITS AND IMPACT CRITERIA

3.1 Roadway Construction Noise Model Noise Limits

Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) default L_{max} noise limits, presented in Table 4, were used to conduct this analysis (FHWA 2006a). Exterior baseline noise levels were assumed to be 65 dBA during the day, 60 dBA in the evening, and 45 dBA at night, consistent with previous EAs (USAF 2009 as cited in USDA 2021).

Table 4 Roadway Construction Noise Model Default Noise Limits

LAND USE	L_{max} NOISE LIMIT (dBA)		
	DAYTIME (0700 – 1800)	EVENING (1800 – 2200)	NIGHTTIME (2200 – 0700)
Residential	90 Impact; 85 Non-Impact	85	80
Commercial	N/A	N/A	N/A
Industrial	N/A	N/A	N/A

Notes:

Non-impact equipment is equipment that generates a constant noise level while in operation.

Impact equipment is equipment that generates an impulse noise. Impulse noise is defined as noise produced by the periodic impact of a mass on a surface, of short duration (generally less than 1 second), high intensity, abrupt onset and rapid decay, and often rapidly changing spectral composition.

L_{max} – maximum A-weighted sound level associated with a given event

N/A – not applicable

3.2 Noise Impact Criteria

The general relationship between noise levels and human perception is shown in Table 5.

Table 5 Relationship Between Noise Levels and Human Perception

INCREASE IN dBA	PERCEPTION
1-2	Not perceptible to the average person
3	Barely perceptible to the human ear
5	Readily perceptible to the human ear
10	Perceived as a doubling of loudness to the average person
15	Perceived as more than a doubling of loudness to the average person

Notes:
Source: AASHTO 2023; FHWA 2011.

For purposes of this analysis, an L_{max} value resulting in an increase in noise exposure of less than 5 dBA over baseline is considered a negligible impact. An increase in noise exposure between 5 dBA over baseline and the RCNM noise levels is considered a minor impact. A noise exposure above the RCNM noise level is considered a moderate impact, consistent with the definition of "substantial impact" in guidance documents (FHWA 2011; American Association of Highway and Transportation Officials [AASHTO] 2023).

4.0 SHORT-TERM NOISE EXPOSURE AND IMPACTS

4.1 Methodology

This noise analysis was conducted following the guidelines in Section 6.4, Construction Noise Prediction Methodology, of the FHWA *Highway Construction Noise Handbook* (FHWA 2006b). A screening-level analysis was conducted to assist in the identification of the appropriate approach. A worst-case noise level scenario was evaluated using the FHWA RCNM in accordance with the FHWA *Roadway Construction Noise Model User's Guide* (FHWA RCNM User's Guide; FHWA 2006a). The worst-case scenario was identified by using the construction or demolition project with the closest sensitive noise receptors. Representative equipment was selected from the default RCNM equipment list, and default noise emission reference levels and usage factors were used for the model. L_{max} exposures were then compared to the default noise impact criteria identified in RCNM and the results used to determine whether additional modeling would be warranted. If the worst-case scenario resulted in L_{max} that were lower than the applicable RCNM noise levels, then further analysis would not be warranted. If L_{max} under the worst-case scenario exceeded the applicable RCNM noise levels, then quantitative analysis of additional scenarios may be justified.

4.2 Worst-Case Construction Scenario

Sensitive noise receptors at WIA include residential housing and the installation chapel (B1118). The closest project activity to sensitive noise receptors would be the demolition of B1128, the gym and open berth housing facility, which are near two sensitive noise receptors: the chapel and the contractor housing subdivision (B1000-series). Potential impacts at both receptors were evaluated in this scenario.

4.2.1 Scenario Inputs

The following inputs were used in RCNM for this analysis.

Land Use

Land use for both the housing and chapel were set as Residential.

Baseline Noise Levels

Consistent with information from previous EAs (USAF 2009 as cited in USDA 2021), daytime, evening, and nighttime baseline noise levels were set at 65, 60, and 45 dBA, respectively.

Noise Metric and Noise Limit Criteria.

The noise metric was set to equivalent continuous sound pressure level (L_{eq}). Default noise limit criteria were used as described in Section 3.2.

Equipment

Table 6 presents the equipment selected and associated default noise emission settings selected for use on the B1128 demolition project.

Table 6 Equipment Used in Roadway Construction Noise Model

DESCRIPTION	IMPACT DEVICE? (YES/NO)	USAGE (%)	ACTUAL L_{max} (dBA)
Crane	No	16	80.6
Dozer	No	40	81.7
Dump Truck	No	40	76.5
Excavator	No	40	80.7
Flat Bed Truck	No	40	74.3
Front End Loader	No	40	79.1
Generator	No	50	80.6
Pickup Truck	No	40	75.0
Pneumatic Tools	No	50	85.2
Warning Horn	No	5	83.2
Welder/Torch	No	40	74.0

Notes:
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

Distance to Receptor

The closest distance between B1128 and the closest point on the exterior of each sensitive receptor was estimated using Google Earth imagery. For the chapel, a distance of 543 feet was used. For the contractor housing subdivision, a distance of 553 feet between B1128 and the exterior of the nearest contractor housing unit (B1011) was used.

Estimated Shielding

For a conservative estimate of potential noise impacts, estimated shielding was set to 0 dBA. For internal exposure for existing construction, an Outside-to-Inside Noise Reduction (OINR) of 25 dBA was used, consistent with the guidance in Appendix A of the FHWA RCNM User's Guide (FHWA 2006a).

4.3 Roadway Construction Noise Model Scenario Results

4.3.1 Chapel

Exterior Noise Exposure

Based on the settings identified in Section 4.2, Table 7 identifies the potential short-term noise exposure at the exterior of the chapel.

Table 7 Potential Short-Term Exterior Noise Exposure at the WIA Chapel

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	L_{max} NOISE LIMIT[1] (dBA)		NOISE LIMIT EXCEEDANCE (dBA)	
			Day/Evening	Night	Day	Evening
Crane	59.8	51.9	85	80	None	None
Dozer	61.0	57.0	85	80	None	None
Dump Truck	55.7	51.8	85	80	None	None
Excavator	60.0	56.0	85	80	None	None
Flat Bed Truck	53.5	49.6	85	80	None	None
Front End Loader	58.4	54.5	85	80	None	None
Generator	59.9	56.9	85	80	None	None
Pickup Truck	54.3	50.3	85	80	None	None
Pneumatic Tools	64.5	61.5	85	80	None	None
Warning Horn	62.5	49.4	85	80	None	None
Welder/Torch	53.3	49.3	85	80	None	None
TOTAL	**64.5**	**65.7**	**85**	**80**	**None**	**None**

Notes:
[1] For purposes of this analysis, construction activities were assumed not to occur between 2200 and 0700 hours.
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

Interior Noise Exposure

Based on the settings identified in Section 4.2, Table 8 identifies the potential short-term interior noise exposure in the chapel.

Table 8 Potential Short-Term Interior Noise Exposure at the WIA Chapel

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	L_{max} NOISE LIMIT[1] (dBA)		NOISE LIMIT EXCEEDANCE (dBA)
			Day/ Evening	Night	
Crane	34.8	26.9	85	80	None
Dozer	36.0	32.0	85	80	None
Dump Truck	30.7	26.8	85	80	None
Excavator	35.0	31.0	85	80	None
Flat Bed Truck	28.5	24.6	85	80	None
Front End Loader	33.4	29.4	85	80	None

Table 8 Potential Short-Term Interior Noise Exposure at the WIA Chapel

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	L_{max} NOISE LIMIT[1] (dBA)		NOISE LIMIT EXCEEDANCE (dBA)
			Day/ Evening	Night	
Generator	34.9	31.9	85	80	None
Pickup Truck	29.3	25.3	85	80	None
Pneumatic Tools	39.5	36.5	85	80	None
Warning Horn	37.5	24.4	85	80	None
Welder/Torch	28.3	24.3	85	80	None
TOTAL	**39.5**	**40.7**	**85**	**80**	**None**

Notes:
[1] For purposes of this analysis, construction activities were assumed not to occur between 2200 and 0700 hours.
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

4.3.2 Contractor Housing Subdivision

Exterior Noise Exposure

Based on the settings identified in Section 4.2, Table 9 identifies the potential short-term noise exposure at the exterior of B1011.

Table 9 Potential Short-Term Exterior Noise Exposure at B1011

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	L_{max} NOISE LIMIT[1] (dBA)		NOISE LIMIT EXCEEDANCE (dBA)
			Day/Evening	Night	
Crane	59.7	51.7	85	80	None
Dozer	60.8	56.8	85	80	None
Dump Truck	55.6	51.6	85	80	None
Excavator	59.8	55.9	85	80	None
Flat Bed Truck	53.4	49.4	85	80	None
Front End Loader	58.2	54.3	85	80	None
Generator	59.8	56.7	85	80	None
Pickup Truck	54.1	50.1	85	80	None
Pneumatic Tools	64.3	61.3	85	80	None
Warning Horn	62.3	49.3	85	80	None
Welder/Torch	53.1	49.1	85	80	None
TOTAL	**64.3**	**65.6**	**85**	**80**	**None**

Notes:
[1] For purposes of this analysis, construction activities are assumed not to occur between 2200 and 0700 hours.
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

Interior Noise Exposure

Based on the settings identified in Section 4.2, Table 10 identifies the potential short-term noise exposure in the interior of B1011.

Table 10 Potential Short-Term Interior Noise Exposure at B1011

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	L_{max} NOISE LIMIT[1] (dBA)		NOISE LIMIT EXCEEDANCE (dBA)
			Day	Evening	
Crane	34.7	26.7	85	80	None
Dozer	35.8	31.8	85	80	None
Dump Truck	30.6	26.6	85	80	None
Excavator	34.8	30.9	85	80	None
Flat Bed Truck	28.4	24.4	85	80	None
Front End Loader	33.2	29.3	85	80	None
Generator	34.8	31.7	85	80	None
Pickup Truck	29.1	25.1	85	80	None
Pneumatic Tools	39.3	36.3	85	80	None
Warning Horn	37.3	24.3	85	80	None
Welder/Torch	28.1	24.1	85	80	None
TOTAL	**39.3**	**40.6**	**85**	**80**	**None**

Notes:
[1] For purposes of this analysis, construction activities are assumed not to occur between 2200 and 0700 hours.
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

4.4 Short-Term Noise Impacts

No exceedances of RCNM noise levels would occur under the worst-case scenario. Noise from the demolition of B1128 would result in an L_{max} of 64.5 and 64.3 dBA at the exterior of B1118 and B1011, respectively. These values are below the assumed daytime baseline levels of 65 dBA and exceed evening baseline noise levels by less than 5 dBA. Construction projects at WIA generally run 12-hour days (0700 – 1900 hours). Therefore, these exceedances would be expected to occur in the early evenings only. These increases would be considered a short-term, negligible increase in ambient noise due to construction.

5.0 LONG-TERM NOISE EXPOSURE AND IMPACTS

5.1 Methodology

The analysis of potential long-term impacts to sensitive noise receptors was conducted using a process based on the guidelines in Section 6.4, Construction Noise Prediction Methodology, of the FHWA *Highway Construction Noise Handbook* (FHWA 2006b). A screening-level analysis was conducted to assist in identification of the appropriate approach. A worst-case noise level scenario was evaluated using the RCNM. The worst-case scenario was selected by identifying the closest project-related noise emission elements to current or future sensitive noise receptor(s) as described in Section 4.3. Equipment representing the project-related noise emission elements was selected from the default RCNM equipment list, and default noise emission reference levels and usage factors were used for the model. Exterior and interior L_{max} were then compared to the default noise impact criteria identified in RCNM, and the results were used to determine whether additional modeling would be warranted. If the worst-case scenario resulted in L_{max} that were lower than the applicable RCNM noise levels, then further analysis would not be warranted. If L_{max} under the worst-case scenario exceeded the applicable RCNM noise levels, then the quantitative analysis of additional scenarios may be justified.

5.2 Worst-Case Long-Term Scenario

The closest long-term noise generating activity to current or future sensitive noise receptors at completion of the Proposed Action were identified as operation of the emergency generator at the CSF, in conjunction with delivery vehicles with backup alarms providing supplies for the CSF, in proximity to the nearest short-term airman dormitory. Exterior and interior noise level scenarios were run in RCNM using the inputs described below.

5.2.1 Scenario Inputs

The following inputs were used in RCNM for this analysis.

Land Use

Land use for both the scenarios was set as Residential.

Baseline Noise Levels

Consistent with information from previous EAs (USAF 2009 as cited in USDA 2021), daytime, evening, and nighttime baseline noise levels were set at 65, 60, and 45 dBA respectively.

Noise Metric and Noise Limit Criteria

The noise metric was set to L_{eq}. The default L_{max} noise limit criteria were used as described in Section 3.2.

Equipment

Table 11 presents the equipment selected and associated default noise emission and usage settings for the worst-case long-term scenario.

Table 11 Equipment Used in Roadway Construction Noise Model for Long-Term Scenario

DESCRIPTION	IMPACT DEVICE? (YES/NO)	USAGE (%)	ACTUAL L_{MAX} (dBA)
Flat Bed Truck (Delivery)[1]	No	18	74.3
Generator, Emergency[2]	No	1	80.6
Pickup Truck (Delivery)[1]	No	18	75.0
Warning Horn (Delivery)[3]	No	2	83.2

Notes:

[1] Used Default Noise Emission Levels. Vehicle usage based on two deliveries per day (one for DFAC, one for laundry), 1 hour duration for each delivery. Deliveries assumed to occur during daytime (0700 – 1800).

[2] Used Default Noise Emission Levels. Generator usage based on default 30 run hours per year used in USAF Air Conformity Assessment Model. Assumed emergency power generation may occur at any hour of the day.

[3] Used Default Noise Emission Levels. Backup alarm on delivery vehicles. Usage based on 5-minute backup duration for each delivery (10 minutes total). Deliveries assumed to occur during daytime (0700 – 1800).

L_{max} – maximum A-weighted sound level associated with a given event

Distance to Receptor

Using conceptual site drawings (Jacobs 2021) and Google Earth imagery, the closest distance between each noise generating element and the closest point on new short-term visiting airman dormitory was estimated. For delivery vehicles, the distance between the dorm and the nearest loading dock was estimated at 186 feet. For the emergency power generation, the distance between the dorm and the nearest new generator building was estimated at 132 feet.

Estimated Shielding

Shielding was estimated based on the guidance in Appendix A, Best Practices for Calculating Estimated Shielding for Use in the RCNM, of the FHWA RCNM User's Guide (FHWA 2006a). No shielding was assumed for the delivery vehicles. For emergency power generation, 8 dBA of shielding was assumed based on a complete enclosure of the noise source. For the dormitory, an overall OINR value of 35 dBA was used based on new construction and a minimum of double-pane windows.

5.3 Roadway Construction Noise Model Scenario Results

5.3.1 Exterior Noise Exposure

Based on the settings identified in Section 5.2, Table 12 identifies the potential long-term noise exposure at the exterior of the new dormitory.

Table 12 Potential Long-Term Exterior Noise Exposure at the New Dormitory

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	DAY/EVENING L_{MAX} NOISE LIMIT (dBA)	NOISE LIMIT EXCEEDANCE (dBA)
Flat Bed Truck (Delivery)	54.9	47.4	85	None
Pickup Truck (Delivery)	55.6	48.1	85	None
Warning Horn (Delivery)	63.8	46.8	85	None
Generator, Emergency	64.2	44.2	85	None
TOTAL	**64.2**	**52.9**	**85**	**None**

Notes:
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

5.3.2 Interior Noise Exposure

Based on the settings identified in Section 5.2, Table 13 identifies the potential long-term noise exposure in the interior of the new dormitory.

Table 13 Potential Long-Term Interior Noise Exposure at the New Dormitory

EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	DAY/EVENING L_{max} NOISE LIMIT (dBA)	NOISE LIMIT EXCEEDANCE (dBA)
Flat Bed Truck (Delivery)	19.9	12.4	85	None
Pickup Truck (Delivery)	20.6	13.1	85	None
Warning Horn (Delivery)	28.8	11.8	85	None
Generator, Emergency	29.2	9.2	85	None
TOTAL	**29.2**	**17.9**	**85**	**None**

Notes:
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

5.3.3 Power Generation at Night

The scenario of emergency power generation during nighttime hours was also evaluated. Based on the settings identified in Section 5.2 with the emergency power generator only, Table 14 identifies the potential noise exposure for the new dormitory.

Table 14 Potential Nighttime Noise Exposure from Emergency Power Generation

LOCATION	EQUIPMENT	L_{max} (dBA)	L_{eq} (dBA)	NIGHTTIME L_{max} NOISE LIMIT (dBA)	NOISE LIMIT EXCEEDANCE (dBA)
Exterior	Generator, Emergency	61.2	41.2	80	None
Interior		26.2	6.2	80	None

Notes:
dBA – A-weighted decibels
L_{eq} – equivalent continuous sound pressure level
L_{max} – maximum A-weighted sound level associated with a given event

5.4 Long-Term Noise Impacts

No RCNM noise limit exceedances were identified for any of analyses performed on the identified worst-case scenario. Neither exterior nor interior L_{max} noise exposures are expected to increase noise levels above the assumed daytime baseline of 65 dBA for the combined delivery and power generation scenario. While evening deliveries combined with emergency power generation could result in a 4.2 dBA increase above the assumed evening background of 60 dBA, this is less than the 5-dBA threshold and would be considered negligible.

For nighttime emergency power generation, exterior L_{max} noise exposures would exceed assumed nighttime baseline levels by an estimated 16.2 dBA; however, interior noise exposures are expected to remain at assumed baseline levels (31.9 dBA). Because the majority of residents would be indoors between 2200 and 0700 and not exposed to exterior noise levels for an appreciable length of time, long-term noise impacts from nighttime emergency power generation are considered to be negligible.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Based on the results of this analysis, the Proposed Action would not result in any exceedances of RCNM Noise Limits. Short-term, negligible (less than 5 dBA) increases in ambient noise may be anticipated during demolition and construction associated with the Proposed Action. Long-term noise impacts associated with the Proposed Action are also expected to be negligible.

6.2 Recommendations

To further minimize the potential for short-term impacts to sensitive noise receptors, it is recommended that USAF limit construction to daytime (0700-1800) or early evening (1800-2000) hours for projects near active residential areas.

7.0 REFERENCES CITED

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Attachment E-1

Road Construction Noise Model Scenario Reports

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10-23-2023
Case Description: WIA C&D Short Term Impacts

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
WIA Chapel (External)	Residential	65.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	543.0	0.0
Dozer	No	40		81.7	543.0	0.0
Dump Truck	No	40		76.5	543.0	0.0
Excavator	No	40		80.7	543.0	0.0
Flat Bed Truck	No	40		74.3	543.0	0.0
Front End Loader	No	40		79.1	543.0	0.0
Generator	No	50		80.6	543.0	0.0
Pickup Truck	No	40		75.0	543.0	0.0
Pneumatic Tools	No	50		85.2	543.0	0.0
Warning Horn	No	5		83.2	543.0	0.0
Welder / Torch	No	40		74.0	543.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	59.8	51.9	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Dozer	61.0	57.0	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Dump Truck	55.7	51.8	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Excavator	60.0	56.0	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Flat Bed Truck	53.5	49.6	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Front End Loader	58.4	54.4	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Generator	59.9	56.9	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Pickup Truck	54.3	50.3	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Pneumatic Tools	64.5	61.5	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Warning Horn	62.5	49.4	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Welder / Torch	53.3	49.3	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Total	64.5	65.7	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10-23-2023
Case Description: WIA C&D Short Term Impacts

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
WIA Housing (External)	Residential	65.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	553.0	0.0
Dozer	No	40		81.7	553.0	0.0
Dump Truck	No	40		76.5	553.0	0.0
Excavator	No	40		80.7	553.0	0.0
Flat Bed Truck	No	40		74.3	553.0	0.0
Front End Loader	No	40		79.1	553.0	0.0
Generator	No	50		80.6	553.0	0.0
Pickup Truck	No	40		75.0	553.0	0.0
Pneumatic Tools	No	50		85.2	553.0	0.0
Warning Horn	No	5		83.2	553.0	0.0
Welder / Torch	No	40		74.0	553.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	59.7	51.7	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Dozer	60.8	56.8	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Dump Truck	55.6	51.6	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Excavator	59.8	55.9	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Flat Bed Truck	53.4	49.4	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Front End Loader	58.2	54.3	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Generator	59.8	56.7	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Pickup Truck	54.1	50.1	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Pneumatic Tools	64.3	61.3	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Warning Horn	62.3	49.3	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Welder / Torch	53.1	49.1	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Total	64.3	65.6	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10-23-2023
Case Description: WIA Long Term Exposure

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Long Term Exterior	Residential	65.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Flat Bed Truck (Delivery)	No	18		74.3	186.0	8.0
Pickup Truck (Delivery)	No	18		75.0	186.0	8.0
Warning Horn (Delivery)	No	2		83.2	186.0	8.0
Generator, Emergency	No	1		80.6	132.0	8.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Flat Bed Truck (Delivery)	54.9	47.4	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Pickup Truck (Delivery)	55.6	48.1	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Warning Horn (Delivery)	63.8	46.8	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Generator, Emergency	64.2	44.2	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Total	64.2	52.9	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10-23-2023
Case Description: WIA Interior Long-Term Background

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
New Dorm	Residential	65.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Background (Night)	No	100		45.0	4.0	35.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Background (Night)	31.9	31.9	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Total	31.9	31.9	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10-23-2023
Case Description: WIA Emergency Power Generation Only

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
EPG - Exterior	Residential	65.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Generator, Emergency	No	1		80.6	186.0	8.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Generator, Emergency	61.2	41.2	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Total	61.2	41.2	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10-23-2023

Case Description: WIA Emergency Power Generation Only

**** Receptor #2 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
EPG - Interior	Residential	65.0	60.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Generator, Emergency	No	1		80.6	186.0	43.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Generator, Emergency	26.2	6.2	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A
Total	26.2	6.2	85.0	N/A	85.0	N/A	80.0	N/A	None	N/A	None	N/A	None	N/A