

Final Environmental Assessment for Hurricane Recovery and Installation Development

Tyndall Air Force Base, Florida

Volume I: Environmental Assessment

March 2020



U.S. AIR FORCE

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

FINDING OF NO SIGNIFICANT IMPACT

for

**HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT AT TYNDALL AIR
FORCE BASE, FLORIDA ENVIRONMENTAL ASSESSMENT**

Pursuant to the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of the National Environmental Policy Act of 1969 (NEPA), Title 40 of the Code of Federal Regulations (CFR) Parts 1500-1508 and the Air Force Environmental Impact Analysis Process Regulations (32 CFR Part 989), the U.S. Air Force (Air Force) has prepared this Environmental Assessment (EA) to evaluate the potential impacts on the natural and human environment associated with the Hurricane Michael Recovery Program at Tyndall Air Force Base (AFB), Florida.

Purpose and Need

The purpose of implementing the installation development projects at Tyndall AFB is to recover mission capabilities at Tyndall AFB, impacted by Hurricane Michael. The impact of the hurricane caused extensive damage to the base's mission, facilities, infrastructure and natural resources areas. The proposed actions would include construction of new facilities and infrastructure, renovations, consolidation, and demolition as well as management of natural resources to restore mission capabilities. The need for the proposed actions is to rebuild Tyndall AFB to a fully operational base, thereby providing new facilities/infrastructure, as well as executing repair, demolition and functionality improvements necessary to support the 325th Fighter Wing (325 FW) mission and tenant units.

Proposed Action

Under the Proposed Action, 28 individual projects spanning six planning areas throughout the installation would be constructed. Three additional projects have been identified which cover more than one planning area, and thus are described as Multi-Area projects. Development in the 2000 Area would include construction of morale, welfare, and recreation facilities at the Marina and recreational facilities that include courts and athletic fields, pavilions and picnic areas, playground, outdoor swimming pool and driving range. Within the 8500 Area, a Subscale Drone facility complex with pilotless aircraft shops would be constructed. Support facilities in this area include an Electronic Counter Measure pod shop and storage, engine test cell, chute shop, and wash rack.

In the 9700 Area, a new Air Force Civil Engineer Center (AFCEC) Research, Development, Testing & Evaluation (RDT&E) Facility and a new Fire Station would be constructed. The RDT&E Facility would include numerous research labs including, but not limited to, cyber operations, firefighting research, ballistics laboratory, materials testing and robotics research. The Flightline Area, which sustained substantial damage during Hurricane Michael, will include demolition and reconstruction of numerous buildings, including a new Aircraft Maintenance Hangar and a Headquarters building for the 53rd Weapons Evaluation Group (53 WEG), an Operations Support Squadron Facility to support the 53 WEG, an Aerospace Operations and Physiology Facility, Gate Complexes, Vehicle Maintenance Facilities, Deployment Center/Flight Line Dining/Army and Air Force Exchange Service facility, and Munition Storage Area facilities. The drainage system within the Flightline

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Area will also be upgraded to provide improved drainage and reduce operational conflicts during major rain events.

A new Vehicle Maintenance Shop, Base Engineer Covered Storage Facility, and a Technical Training Classroom are proposed for construction within the Silver Flag Area. The Support Area, which houses much of the administrative, dorm, and headquarters buildings, was also severely damaged during Hurricane Michael; consequently, most of the facilities require demolition and reconstruction. Projects in the Support Area include construction of the 325 FW Headquarters Building; a Civil Engineer Squadron, Base Contracting Squadron, and United States Army Corps of Engineers (USACE) Complex; a Logistics Readiness Squadron Complex; an Emergency Management and Emergency Operations Complex; a Mobility Storage Facility for Security Forces Squadron; new lodging and dormitory facilities; Child Development Center; Chapel; and Gate Complexes.

The Multi-Area projects include the airfield drainage mentioned above, demolition of 268 buildings throughout the installation, and utility replacements and upgrades to support the new facilities. Utility upgrades include water, wastewater, communication, power transmission facilities and security fences; these projects would occur within existing utility corridors and rights-of-way.

Alternatives

Action Alternatives for projects in each of the planning areas were evaluated against a set of selection standards to determine which alternatives would be carried forward for detailed environmental impact analysis. Multiple Action Alternatives were evaluated against selection standard criteria for projects in the Flightline, Support, and 9700 Areas. Only the Action Alternatives that meet all selection standards were analyzed in detail for potential environmental impacts. Proposed projects in the 2000, 8500, and Silver Flag Areas, as well as the Multi-Area building demolitions, airfield drainage, and utility corridor projects are subjected to unique constraints due to the nature of the projects and the areas in which they would be implemented. Therefore, only a single Action Alternative was considered for each of these projects. Additionally, a No Action Alternative was analyzed for each of the project areas.

Demolitions would be expected to begin in Fiscal Year (FY) 2020; construction within the Flightline Area would be priority and expected to begin in the third quarter of FY 2021 and last for approximately four years. The new lodging facilities, dormitories, child development center and gate complexes would begin around the same time and would be expected to be completed within two years. The remainder of the projects would be expected to be initiated in the fall of 2023 and require approximately two years to complete. All projects would be scheduled to be completed by the end of 2025.

The No Action Alternative would not allow demolition of damaged facilities and construction of new facilities and infrastructure. Under this alternative, Tyndall AFB would not be able to meet its mission. Additionally, the damaged facilities would further deteriorate and possibly increase health and safety hazards.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Environmental Consequences

The Proposed Actions would have no effect on geology, airspace, or visual resources. The Air Force has determined that the Proposed Actions may affect and is likely to adversely affect the endangered plant telephus spurge (*Euphorbia telephioides*) due to construction of the Gate Complex in the Support Area; Section 7 Consultation, under the Endangered Species Act, has been completed to identify conservation measures to offset these impacts.

Negligible to minor impacts would occur on air quality; ambient noise levels; safety and occupational health; soils; vegetation/wildlife habitat; ground and surface water supplies and quality; wildlife populations; and hazardous and solid waste. Up to 134.9 acres of wetlands, 120,300 linear feet (LF) of drainage ditches, 15.8 acres of stormwater management pond/open water/drainage features, and 126.9 acres of floodplains would be impacted. No major long-term impacts on demographics or social services and conditions would be expected, including demand for housing, education, law enforcement, fire protection, emergency medical services, and medical services. Disproportionate impacts on minority or low-income populations would not be expected.

Mitigation Measure and Permit Requirements

The following mitigation measures and permit requirements are required in the areas of water resources, biological resources, hazardous materials/waste, and cultural resources:

Water Resources

- Acquire all necessary wetlands and water resource permits for the Proposed Actions, including, but not limited to National Pollutant Discharge Elimination System (NPDES) stormwater permit(s), Environmental Resource Permit(s), Clean Water Act (CWA) Section 404 Dredge and Fill Permit, Section 401 water quality certification.
- Provide mitigation, as determined by regulatory agencies during the permitting process and to be verified during final design, for approximately 134.9 acres of wetland impact, estimated in the Final EA as equivalent to 75.95 functional units of mitigation credit.
- Provide mitigation, as determined by regulatory agencies during the permitting process and to be verified during final design, for other surface waters, totaling approximately 120,300 LF of drainage features, and 15.8 acres of stormwater pond/open water/drainage features.
- Implement best management practices (BMPs) as defined in a Stormwater Pollution Prevention Plan (SWPPP) to reduce or eliminate the potential for eroded soils and contaminants from entering surface water bodies and groundwater.
- Mitigate for the loss of approximately 126.9 acres of 100-year floodplain, as determined by the Final EA and to be verified in final design, by providing compensatory storage, excavating material within or adjacent to the same floodplain to be used as fill. Compensatory storage must be provided in a manner that does not disturb or impact wetlands, endangered vegetation, or potential cultural sites.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Wherever possible as determined by final design, elevate all facilities above the base flood elevation, apply construction period erosion and sedimentation controls, and use pervious surfaces for stormwater retention and treatment.

Biological Resources

- Prior to clearing and development, survey project areas for protected wildlife and listed species per Federal and state protocols.
- Conduct construction and demolition activities outside of shorebird breeding seasons (generally April, but potentially as early as mid-February, through August), where feasible.
- Only clear nesting sites when ready to build. Cleared areas that could become potential nesting sites will not be left for an extended amount of time. Proposed work sites will be monitored during the nesting season prior to clearing, demolition, or construction activities to ensure no active nests are present. If nesting is observed within or adjacent to a demolition or construction work site prior to or after the start of work, coordination with the Florida Fish and Wildlife Conservation Commission (FWC) will be implemented to discuss nest buffers and other avoidance and minimization measures.
- Design lighting systems to avoid or reduce illumination effects on sea turtles.
- As identified by completion of Section 7 consultation with U.S. Fish and Wildlife Service (USFWS), avoid telephus spurge populations at project areas, if practicable, or salvage/relocate/enhance the affected populations.
- Suspend all work activities until encountered Florida pine snake(s) are allowed to leave with no support or hinderance.
- Adhere to Tyndall AFB Integrated Natural Resources Management Plan measures to control nuisance interactions with Florida black bear populations.
- Within 30 days of ground disturbance, Tyndall AFB Natural Resources would complete a gopher tortoise survey at and in the vicinity of the construction sites. If any found burrows cannot be avoided by 25 feet, the tortoises and any commensal species would be relocated in accordance with Tyndall AFB's Threatened and Endangered Species Component Plan and FWC's current guidelines.

Cultural Resources

- If prehistoric or historic artifacts that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, cease all activities involving subsurface disturbance in the vicinity of the discovery. Contact the Florida Division of Historical Resources and do not resume work without verbal and/or written authorization.
- In the event that unmarked human remains are encountered during permitted activities, stop all work immediately and notify the proper authorities within 24 hours.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Avoid demolition of Building 703 until adverse effects are resolved with the Florida State Historic Preservation Office (SHPO), and post-resolution, integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions.
- Document Building 3160 and 2894 on a Florida Master Site File Historic Structure Form for submittal to SHPO.

Hazardous Materials/Waste and Solid Waste

- Report any spills or discharges discovered during the course of demolition and construction.
- Manage hazardous materials and disposal of hazardous substances in compliance with Tyndall AFB's Hazardous Waste Management Plan.
- Coordinate development on Environmental Restoration Program (ERP) sites with AFCEC and address any applicable land use controls by evaluating project implementation to ensure continued protectiveness for human health and the environment.
- Ensure construction contractor compliance with 29 CFR 1910.120 to address the health and safety of its employees during construction and demolition activities, with respect to worker exposure to hazardous substances and proper management of soil and groundwater encountered during construction, including testing, handling, and disposal procedures.
- Comply with state requirements for the abandonment of any monitoring wells, injection wells, extraction wells, sparge wells, or similar treatment facilities that are found within the area of the construction and demolition activities.

Public Review and Stakeholder Coordination

Coordination letters were submitted to numerous public stakeholders, including the Florida Clearinghouse, SHPO, USFWS, and Native American Tribes claiming cultural affinity to the area. An early notification of impacts on wetlands and floodplains was published in the *Panama City News Herald* in October 2019. Copies of the notice and coordination letters are included in **Appendix B** of the EA. The Draft EA was released for public review for 30 days in February 2020, with a Notice of Availability published in the *Panama City News Herald*. No public comments on the Draft EA were received. The following federal, state and local regulatory agencies and tribal governments have responded to the Draft EA or project-specific consultations related thereto: the FDEP Clearinghouse, the FDEP air, water and waste management divisions, the FWC, the SHPO, the Poarch Band of Creek Indians, and the Seminole Tribe of Florida.

Finding of No Significant Impact

Based on my review of the facts and analyses presented in the attached EA, I conclude that the Proposed Actions would not have a significant impact on the natural or human environment either by itself or cumulatively, with the potential exception of Building 703, noted below. The requirements of NEPA and the CEQ's regulations have been fulfilled. An Environmental Impact Statement is not required and will not be prepared. I make no finding at this time with regard to Building 703, and I will withhold any finding until adverse effects on that Building are resolved with the Florida SHPO.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Finding of No Practicable Alternative

Executive Order (EO) 11990, *Protection of Wetlands*, (24 May 1977) directs agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland and the proposed construction incorporates all possible measures to limit harm associated with development in the wetland. Agencies should use economic and environmental data, agency mission statements, and any other pertinent information when deciding whether or not to build in wetlands. EO 11990 directs each agency to provide for early public review of plans for construction in wetlands. In accordance with EO 11990 and 32 CFR Part 989, a Finding of No Practicable Alternative (FONPA) must accompany the Finding of No Significant Impact (FONSI) stating why there are no practicable alternatives to development within or affecting wetland areas.

Similarly, EO 11988, *Floodplain Management* (May 24, 1977), requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. If it is found that there is no practicable alternative, the agency must minimize potential harm to the floodplain and circulate a notice explaining why the action is to be located in the floodplain prior to taking action. Finally, new construction in a floodplain must apply accepted flood proofing and flood protection to include elevating structures above the base flood level rather than filling in land. In accordance with EO 11988, a FONPA must accompany the FONSI stating why there are no practicable alternatives to development within or affecting floodplains.

The Proposed Actions would result in impacts to both wetlands and floodplains. The following FONPA is therefore presented with the FONSI, pursuant to EO 11990 and EO 11988.

Wetlands: Wetland impacts would be reduced to the maximum extent possible through project design and implementation of environmental protection measures. Pursuant to Section 404(b)(1) of the CWA, wetland impacts must be avoided to the greatest extent practicable. During the design and permitting phase of the Proposed Actions, jurisdictional wetlands would need to be delineated in accordance to the USACE's 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*. Any necessary agency coordination and required permits would be acquired prior to commencing any ground-breaking activities associated with construction. Measures to minimize wetland impacts may include site plan reconfiguration, installation of buffer areas along the perimeter of wetlands, or erosion controls to prevent sedimentation in adjacent wetlands. Construction activities associated with these projects would be conducted in accordance with a Construction Site NPDES permit and its associated procedures as detailed in erosion and sediment control plans (ESCP); SWPPP; and Spill Prevention, Control, and Countermeasures Plans.

As noted in the attached EA, there are no practicable alternatives to the Proposed Actions that would avoid all impacts or further minimize impacts to wetlands because the objectives sought by these projects preclude the selection of any practicable alternatives due to mission requirements,

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

installation layout constraints, and the nature of proposed projects. In addition to the Preferred Alternatives, multiple project sites were evaluated throughout the base using the selection standards identified in the EA. Approximately 134.9 acres of wetlands occur within the proposed project areas. Other surface waters identified in the proposed project areas consist of approximately 120,300 LF of drainage ditches and 15.8 acres of a stormwater management pond/open water/drainage features. A formal Jurisdictional Determination of the wetlands and other surface waters will be determined during the state and Federal permitting process. Of the 134.9 acres of wetlands, an estimated 3.8 acres of wetlands occur within the 2000 Area, which is the site of the marina and associated facilities. Impacts to wetlands within this area are unavoidable because construction of such facilities is required to be near water bodies. The greatest wetland acreage (70.7 acres) occurs within the 9700 Area. The Air Force evaluated four other locations for these projects and determined that none would fully satisfy the selection standards. The alternate sites either resulted in incompatible land use between the AFCEC testing facilities and nearby dormitory facilities, did not support Remotely Piloted Aircraft mission due to proximity to the Flightline, or would be situated completely within ERP sites. The remaining impacts would occur in the 8500 (2.3 acres), Support (1.0 acre), and Multi-Areas (57.1 acres). Approximately 134.9 acres of wetlands located within the proposed project areas were assessed utilizing the Uniform Mitigation Assessment Method. Based on this assessment, the estimated total numeric value of functions to fish and wildlife lost as a result of construction of the Proposed Actions is 75.95. Two additional alternative locations were considered for the Support Area projects and determined that neither would fully satisfy the selection standards. The alternate sites either would not support mission needs or would not improve pedestrian and vehicular circulation or optimize development patterns within the Support Area. The remaining project alternatives are constrained either due to the location or the nature of the projects and therefore could not be located to other sites. Taking all the environmental, economic, and other pertinent factors into account, pursuant to EO 11990, the authority delegated by Secretary of the Air Force Order 791.1, and taking into consideration the submitted information, I find that there is no practicable alternative to this action and the proposed action includes all practical measures to minimize harm to the environment.

Floodplains: Similarly, there is no practicable alternative to implementing the Proposed Actions at Tyndall AFB outside of floodplains. Temporary construction activity and long-term impacts due to the construction of new structures associated with the Proposed Actions would occur within the 100-year floodplain. Construction related impacts to floodplains in general would be minimized through implementation of an approved ESCP, construction BMPs, and other appropriate environmental protection measures and through adherence to the NPDES permit and SWPPP. Long-term impacts to floodplains from the Proposed Actions would be minimized by implementing guidelines provided in EO 11988 for construction in a floodplain to the extent practicable, including site grading so that structures are elevated to at least one foot above the base flood level and providing compensatory storage within the floodplain.

Overall, approximately 126.9 acres of the proposed project areas are located within the 100-year floodplain. Approximately 67.5 acres of those floodplains occur within the Multi-Area projects, including replacement of a utility corridor that is located within floodplains. Approximately 34.3 acres of floodplains occur within the 9700 Area. Projects in the 2000 Area are located within 18.2 acres of floodplains adjacent to the proposed marina development. The remaining floodplains occur

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

within the proposed 8500 (0.1 acre), Flightline (0.9 acre), and Support Area (5.9 acres) projects. Implementation of the Proposed Actions would not increase the frequency, duration, depth, or velocity of flood flows.

As noted in the attached EA, there are no practicable alternatives to the Proposed Actions that would avoid all impacts or further minimize impacts to floodplains because the objectives sought by these projects preclude the selection of any practicable alternatives due to mission requirements, installation layout constraints, and the nature of proposed project. In addition to the Preferred Alternatives, multiple project sites were evaluated throughout the base using the selection standards identified in the EA. Two additional locations were evaluated for the Flightline Area projects and the Air Force determined that one would not meet mission needs and the other would result in explosives safety setback areas encroaching on public traffic route U.S. Highway 98. As described above, alternate sites for the 9700 Area facilities were also evaluated but eliminated for various reasons. The remaining projects that would impact floodplains are constrained to their proposed locations due to installation layout and the nature of the projects. Taking all the environmental, economic, and other pertinent factors into account, pursuant to EO 11988, the authority delegated by Secretary of the Air Force Order 791.1, and taking into consideration the submitted information, I find that there is no practicable alternative to this action and the proposed action includes all practical measures to minimize harm to the environment.

KATZER.DEE.J.11 Digitally signed by
53738854 KATZER.DEE.J.1153738854
Date: 2020.04.01 11:23:56 -04'00'

1 April 2020

DEE JAY KATZER, Colonel,
U.S. Air Force Chief, Civil Engineer Division
HQ Air Combat Command (ACC/A4C)

Date

**FINAL ENVIRONMENTAL ASSESSMENT
FOR
HURRICANE RECOVERY AND INSTALLATION
DEVELOPMENT AT
TYNDALL AIR FORCE BASE, FLORIDA**



PREPARED FOR:
Department of the Air Force

March 2020

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

COVER SHEET

Responsible Agency: 325th Fighter Wing (325 FW), Tyndall Air Force Base (AFB), Florida

Proposed Action: Hurricane Michael Recovery Program at Tyndall AFB, Bay County, Florida

Points of Contact: 325 CES/CEIEC, Attn: Environmental Assessment for Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida. 540 Mississippi Ave Building 36270 Tyndall AFB, FL 32403

Report Designation: Environmental Assessment (EA)

Abstract: The 325 FW at Tyndall AFB is planning demolition, construction and renovation of numerous facilities throughout the installation that were severely damaged by Hurricane Michael in 2018. Under the Proposed Action, 28 individual projects spanning six planning areas throughout the installation would be constructed. Three additional projects have been identified which cover more than one planning area, and thus are described as Multi-Area projects. The purpose of implementing the installation development projects at Tyndall AFB is to recover mission capabilities at Tyndall AFB, impacted by Hurricane Michael. The need for the proposed actions is to rebuild Tyndall AFB to a fully operational base, thereby providing new facilities/infrastructure, as well as executing repair, demolition and functionality improvements necessary to support the 325 FW mission and tenant units.

There would be no new missions or personnel assigned to Tyndall AFB as a result of the Proposed Action. The Air Force proposes to implement the development over a five-year period beginning in 2020. Demolition of damaged buildings and construction of new structures within the Flightline Area, including hangars and headquarters facilities, would be the priority projects. Up to 1,164 acres of land would be developed, much of which is currently developed or previously developed.

The following resources were identified for study in this EA: Air Quality, Noise, Safety and Occupational Health, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Wastes, Socioeconomic Resources, and Environmental Justice.

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Privacy Act Advisory: As required by law, substantive comments will be addressed in the Final Environmental Assessment and made available to the public. Any personal information provided will be kept confidential. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final Environmental Assessment. Names, personal home addresses and phone numbers will not be published in the Final Environmental Assessment.

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

LIST OF ACRONYMS AND ABBREVIATIONS

325 CES/ CEIEC	325th Civil Engineer Squadron/Environmental Element, Compliance	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
325 FW	325th Fighter Wing	CES	Civil Engineer Squadron
53 WEG	53rd Weapons Evaluation Group	CFR	Code of Federal Regulations
		CH ₄	Methane
		CO	Carbon Monoxide
		CO ₂	Carbon Dioxide
AAFES	Army and Air Force Exchange Service	CO ₂ e	Carbon Dioxide Equivalent
ACAM	Air Conformity Applicability Model	COPC	Contaminants of Potential Concern
ACS	American Community Survey	CR	County Road
AFB	Air Force Base	CRM	Cultural Resources Management
AFCEC	Air Force Civil Engineer Center	CWA	Clean Water Act
AFFF	Aqueous Film-Forming Foam	CZMA	Coastal Zone Management Act
AFI	Air Force Instruction	CZMP	Coastal Zone Management Plan
AFIMSC	Air Force Installation and Missions Support Center		
AFMAN	Air Force Manual	dB	Decibels
AFOSH	Air Force Occupational Safety and Health	dBA	A-weighted decibel
AFPD	Air Force Policy Directive	DNL	Average Day/Night Sound Level
AICUZ	Air Installations Compatible Use Zone	DoD	Department of Defense
Air Force	United States Air Force	DoDI	Department of Defense Instruction
ALT CP	Alternate Command Post	EA	Environmental Assessment
ARAR	Applicable or Relevant and Appropriate Requirements	EIAP	Environmental Impact Assessment Process
AST	Aboveground Storage Tank	EIS	Environmental Impact Statement
BFE	Base Flood Elevation	EM	Emergency Management
BMP	Best Management Practice	EO	Executive Order
BO	Biological Opinion	EOC	Emergency Operations Center
BRA	Baseline Risk Assessment	EOD	Explosive Ordnance Disposal
BTEX	Benzene, Toluene, Ethylbenzene, Xylene	ERP	Environmental Resource Permit
		ERP	Environmental Restoration Program
		ESA	Endangered Species Act
CAA	Clean Air Act	ESCP	Erosion and Sediment Control Plan
CCCL	Coastal Construction Control Line	ESQD	Explosive Safety Quantity Distance
CE	Civil Engineer		
CEQ	Council on Environmental Quality	F.A.C.	Florida Administrative Code
		F.S.	Florida Statutes

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

FAA	Federal Aviation Administration	INRMP	Integrated Natural Resources Management Plan
FCMP	Florida Coastal Management Program	IRP	Installation Restoration Program
FDACS	Florida Department of Agriculture and Consumer Services	ISWMP	Integrated Solid Waste Management Plan
FDHR	Florida Division of Historical Resources	ITN	Information Transfer Node
FDEP	Florida Department of Environmental Protection	km	Kilometer
FDOT	Florida Department of Transportation	LBP	Lead-based Paint
FEMA	Federal Emergency Management Agency	LF	Linear Feet
FFA	Federal Facility Agreement	L _{max}	Maximum Sound Level
FLUCFCS	Florida Land Use, Cover and Forms Classification System	LRS	Logistics Readiness Squadron
FMSF	Florida Master Site File	LTO	Long-Term Operations
FONPA	Finding of No Practicable Alternative	MBTA	Migratory Bird Treaty Act
FONSI	Finding of No Significant Impact	MDG	Medical Group
FS	Feasibility Study	MHE	Material Handling Equipment
FTU	Formal Training Unit	MHW	Mean High Water
FWC	Florida Fish and Wildlife Conservation Commission	MMRP	Military Munitions Response Program
FY	Fiscal Year	MSA	Munition Storage Area
GCTL	Groundwater Cleanup Target Level	MWR	Morale, Welfare, and Recreation
GHG	Greenhouse Gas	N ₂ O	Nitrogen Oxide
GSRC	Gulf South Research Corporation	NAAQS	National Ambient Air Quality Standards
HAP	Hazardous Air Pollutant	NEPA	National Environmental Policy Act
HAZWOPER	Hazardous Waste, Operations, and Emergency Response	NEW	Net Explosive Weight
HFC	Hydrofluorocarbons	NFA	No Further Action
HQ	Headquarters	NHPA	National Historic Preservation Act
HQ ACC	Headquarters Air Combat Command	NO ₂	Nitrogen Dioxide
HWAS	Hazardous Waste Accumulation Site	NOA	Notice of Availability
HWMP	Hazardous Waste Management Plan	NO _x	Nitrogen Oxide
IAP	Initial Accumulation Point	NPDES	National Pollutant Discharge Elimination System
IBNB	Imperiled Beach-Nesting Birds	NRHP	National Register of Historic Places
ICRMP	Integrated Cultural Resources Management Plan	NSS	Noise Sensitive Sites
IDP	Installation Development Plan	NFWMD	Northwest Florida Water Management District
		O ₃	Ozone
		OSHA	Occupational Health and Safety Administration
		OSS	Operations Support Squadron
		OWS	Oil/Water Separator

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

PAH	Polycyclic Aromatic Hydrocarbons	TRPH	Total Recoverable Petroleum Hydrocarbons
Pb	Lead		
PCB	Polychlorinated Biphenyls	U.S.	United States
PCE	Perchloroethylene	U.S.C.	United States Code
PFC	Perfluorocarbons	UFC	Unified Facilities Criteria
PFOA	Perfluorooctanoic Acid	UMAM	Uniform Mitigation Assessment Method
PFOS	Perfluorooctane Sulfonate		
PM ₁₀	Particulate Matter less than 10 microns in diameter	USACE	United States Army Corps of Engineers
PM _{2.5}	Particulate Matter less than 2.5 microns in diameter	USEPA	United States Environmental Protection Agency
PMO	Program Management Office	USFWS	United States Fish and Wildlife Service
POL	Petroleum, Oil, and Lubricants		
ppb	Parts Per Billion	UST	Underground Storage Tank
PPE	Personal Protective Equipment	UXO	Unexploded Ordnances
ppm	Parts Per Million		
		VAQ	Visiting Airmen's Quarters
R&D	Research and Development	VC	Vinyl Chloride
RA	Remedial Action	VOC	Volatile Organic Compounds
RCRA	Resource Conservation and Recovery Act	VOQ	Visiting Officers Quarters
		VQ	Visiting Quarters
RDT&E	Research, Development, Testing & Evaluation		
		WEG	Weapons Evaluation Group
RED HORSE	Rapid Engineers Deployable Heavy Operations Repair Squadron Engineers	µg/m ³	Micrograms Per Cubic Meter
RI	Remedial Investigation		
ROD	Record of Decision		
ROI	Region of Influence		
RPA	Remotely Piloted Aircraft		
SCTL	Soil Cleanup Target Level		
SF	Square Feet		
SF ₆	Sulfur Hexafluoride		
SFHA	Special Flood Hazard Area		
SFS	Security Forces Squadron		
SHPO	State Historic Preservation Officer		
SIP	State Implementation Plan		
SO ₂	Sulfur Dioxide		
SPCC	Spill Prevention, Control, and Countermeasures		
SR	State Road		
SWPPP	Stormwater Pollution Prevention Plan		
SY	Square Yards		
TBD	To Be Determined		
TCE	Tetrachloroethylene		

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
1.0	PURPOSE AND NEED	1-1
	1.1 Introduction.....	1-1
	1.2 Background.....	1-3
	1.3 Purpose and Need.....	1-3
	1.4 Projects Identified for Hurricane Recovery and Installation Development	1-4
	1.5 Environmental Analysis Approach	1-34
	1.6 Interagency/Intergovernmental Coordination and consultations	1-34
	1.6.1 Interagency Coordination and Consultations	1-34
	1.6.2 Government to Government Consultations.....	1-34
	1.6.3 Other Agency Consultations	1-35
	1.7 Public and Agency Review of the Environmental Assessment	1-35
	1.7.1 Public and Agency Comments on the Draft EA	1-36
	1.7.2 Summary of Changes to the Draft EA	1-37
	1.8 Summary of Environmental Consequences and Mitigation Measures	1-39
	1.9 Decision to be Made	1-44
2.0	DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES	2-1
	2.1 Proposed Action.....	2-1
	2.2 Selection Standards	2-1
	2.3 Proposed Actions and Alternatives	2-2
	2.3.1 Flightline Area Alternatives.....	2-3
	2.3.2 Support Area Alternatives.....	2-10
	2.3.3 9700 Area Alternatives	2-14
	2.3.4 Alternatives Considered for Remaining Projects.....	2-23
	2.3.5 Alternatives Eliminated from Detailed Consideration	2-24
3.0	AFFECTED ENVIRONMENT	3-1
	3.1 Scope of the Analysis.....	3-1
	3.1.1 Resources Analyzed.....	3-1
	3.1.2 Resources Eliminated from Detailed Analysis	3-1
	3.1.2.1 Visual Resources	3-1
	3.1.2.2 Airspace	3-1
	3.1.2.3 Geology	3-2
	3.2 Air Quality and Climate Change.....	3-2
	3.2.1 National Ambient Air Quality Standards.....	3-2
	3.2.2 Existing Air Quality Conditions	3-4
	3.2.2.1 Clean Air Act Conformity	3-4
	3.2.2.2 Hazardous Air Pollutants.....	3-4
	3.2.2.3 Stationary and Mobile Source Emissions	3-4
	3.2.2.4 Greenhouse Gas Emissions.....	3-5
	3.3 Noise	3-5
	3.4 Safety and Occupational Health.....	3-8
	3.4.1 Construction and Demolition Safety.....	3-8
	3.4.2 Mission Safety	3-9
	3.5 Land Use	3-10

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>		<u>Page</u>
	3.5.1 Existing Land Use	3-11
	3.5.2 Planning Districts	3-11
	3.5.3 Land Use Constraints	3-14
3.6	Soils.....	3-15
3.7	Water Resources	3-19
	3.7.1 Surface Water.....	3-19
	3.7.2 Groundwater	3-21
	3.7.3 Wetlands	3-22
	3.7.3.1 Affected Environment	3-22
	3.7.4 Floodplains.....	3-43
	3.7.5 Coastal Zone Management.....	3-52
3.8	Biological Resources.....	3-52
	3.8.1 Vegetation and Wildlife	3-52
	3.8.1.1 Vegetation.....	3-52
	3.8.1.2 Wildlife	3-59
	3.8.1.3 Federally Listed Species	3-60
	3.8.1.4 State Listed Species	3-66
3.9	Cultural Resources	3-69
	3.9.1 Affected Environment.....	3-69
	3.9.1.1 Previous Investigations	3-72
	3.9.1.2 Previously Recorded Resources.....	3-74
	3.9.1.3 Current Investigation	3-77
3.10	Hazardous Materials/Waste and Solid Waste	3-78
	3.10.1 Hazardous Materials	3-78
	3.10.2 Hazardous waste	3-79
	3.10.3 Toxic Substances.....	3-79
	3.10.4 Solid Waste	3-80
	3.10.5 Environmental Restoration Program.....	3-80
3.11	Socioeconomics	3-89
	3.11.1 Population	3-89
	3.11.2 Economic Activity (Employment and Earnings)	3-89
	3.11.3 Housing	3-90
	3.11.4 Education	3-90
	3.11.5 Installation and Public Services	3-90
3.12	Environmental Justice	3-91
	3.12.1 Minority and Low-Income Populations	3-91
	3.12.2 Children	3-92
4.0	ENVIRONMENTAL CONSEQUENCES	4-1
	4.1 Air Quality and Climate Change.....	4-1
	4.1.1 Proposed Actions	4-2
	4.1.1.1 Operational Activities	4-2

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>		<u>Page</u>
	4.1.1.2 Demolition and Construction Activities	4-2
	4.1.1.3 Emissions Results	4-3
	4.1.1.4 Clean Air Act General Conformity Rule Applicability	4-5
	4.1.1.5 Attainment Criteria Pollutant Emissions	4-5
	4.1.1.6 Greenhouse Gas Emissions and Climate Change	4-6
	4.1.1.7 Mitigation Measures	4-6
	4.1.2 No Action Alternative	4-6
4.2	Noise	4-6
	4.2.1 Proposed Actions	4-6
	4.2.1.1 Operational Activities	4-6
	4.2.1.2 Demolition and Construction Activities	4-7
	4.2.1.3 Mitigation Measures	4-7
	4.2.2 No Action Alternative	4-8
4.3	Safety and Occupational Health	4-8
	4.3.1 Proposed Actions	4-8
	4.3.1.1 Construction Safety	4-8
	4.3.1.2 Explosives and Munitions Safety	4-9
	4.3.1.3 Mission Safety	4-10
	4.3.1.4 Mitigation Measures	4-10
	4.3.2 No Action Alternative	4-10
4.4	Land Use	4-10
	4.4.1 Proposed Actions	4-11
	4.4.1.1 Mitigation Measures	4-12
	4.4.2 No Action Alternative	4-12
4.5	Soils	4-13
	4.5.1 Proposed Actions	4-13
	4.5.1.1 Mitigation Measures	4-14
	4.5.2 No Action Alternative	4-14
4.6	Water Resources	4-14
	4.6.1 Proposed Actions	4-14
	4.6.1.1 Surface Water	4-14
	4.6.1.2 Groundwater	4-14
	4.6.1.3 Wetlands	4-15
	4.6.1.4 Floodplains	4-16
	4.6.1.5 Coastal Zone Management	4-17
	4.6.1.6 Mitigation Measures	4-22
	4.6.2 No Action Alternative	4-23
4.7	Biological Resources	4-23
	4.7.1 Proposed Actions	4-23
	4.7.1.1 Mitigation Measures	4-27
	4.7.2 No Action Alternative	4-28

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>	<u>Page</u>
4.8 Cultural Resources	4-28
4.8.1 Proposed Actions	4-28
4.8.1.1 Mitigation Measures	4-28
4.8.2 No Action Alternative	4-29
4.9 Hazardous Materials/Waste and Solid Waste	4-29
4.9.1 Proposed Actions	4-29
4.9.1.1 Hazardous Materials	4-29
4.9.1.2 Hazardous Waste	4-29
4.9.1.3 Toxic Substances	4-30
4.9.1.4 Solid Waste	4-30
4.9.1.5 Environmental Restoration Program	4-31
4.9.1.6 Mitigation Measures	4-38
4.9.2 No Action Alternative	4-38
4.10 Socioeconomics, Environmental Justice, and The Protection of Children	4-38
4.10.1 Proposed Actions	4-38
4.10.1.1 Socioeconomic Resources	4-38
4.10.1.2 Environmental Justice	4-39
4.10.1.3 Protection of Children	4-40
4.10.1.4 Mitigation Measures	4-40
4.10.2 No Action Alternative	4-40
4.11 Cumulative Impacts	4-40
4.11.1 Air Quality	4-52
4.11.1.1 Proposed Actions	4-52
4.11.1.2 No Action Alternative	4-52
4.11.2 Noise	4-53
4.11.2.1 Proposed Actions	4-53
4.11.2.2 No Action Alternative	4-53
4.11.3 Safety and Occupational Health	4-53
4.11.3.1 Proposed Action	4-53
4.11.3.2 No Action Alternative	4-53
4.11.4 Land use	4-53
4.11.4.1 Proposed Actions	4-53
4.11.4.2 No Action Alternative	4-54
4.11.5 Soils	4-54
4.11.5.1 Proposed Actions	4-54
4.11.5.2 No Action Alternative	4-54
4.11.6 Water Resources	4-54
4.11.6.1 Proposed Actions	4-54
4.11.6.2 No Action Alternative	4-55
4.11.7 Biological Resources	4-55
4.11.7.1 Proposed Action	4-55

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>	<u>Page</u>
4.11.7.2 No Action Alternative.....	4-55
4.11.8 Cultural Resources	4-55
4.11.8.1 Proposed Actions	4-55
4.11.8.2 No Action Alternative.....	4-55
4.11.9 Hazardous Materials and Waste.....	4-56
4.11.9.1 Proposed Actions	4-56
4.11.9.2 No Action Alternative.....	4-56
4.11.10 Socioeconomics and Environmental Justice	4-56
4.11.10.1 Proposed Actions	4-56
4.11.10.2 No Action Alternative.....	4-57
5.0	MITIGATION MEASURES AND REQUIRED PERMITS5-1
6.0	LIST OF PRIMARY PREPARERS.....6-1
7.0	LIST OF PERSONS CONSULTED.....7-1
8.0	REFERENCES.....8-1

LIST OF TABLES

Table 1.4-1	2000 Area Development	1-5
Table 1.4-2	8500 Area Development	1-10
Table 1.4-3	9700 Area Development	1-13
Table 1.4-4	Flightline Area Development.....	1-16
Table 1.4-5	Silver Flag Area Development.....	1-22
Table 1.4-6	Support Area Development	1-25
Table 1.4-7	Multi-Area Development	1-30
Table 1.7-1	Summary of Changes to Draft EA	1-37
Table 1.8-1	Summary of Environmental Consequences and Mitigation Measures	1-39
Table 2.3-1	Project-Specific Selection Standards Summary.....	2-3
Table 2.3-2	Selection Standards Evaluation: Flightline Area Alternatives.....	2-5
Table 2.3-3	Selection Standards Evaluation: Support Area Alternatives.....	2-11
Table 2.3-4	Selection Standards Evaluation: 9700 Area Alternatives	2-16
Table 3.2-1	National Ambient Air Quality Standards.....	3-3
Table 3.2-2	Air Monitoring Data Summary	3-3
Table 3.2-3	Air Quality Permit Emissions Report – Tyndall AFB 2018	3-5
Table 3.3-1	Sound Levels and Human Response.....	3-6
Table 3.6-1	Soil Types and Characteristics Represented on Tyndall AFB	3-15
Table 3.6-2a	Soils – 2000 Area projects	3-17
Table 3.6-2b	Soils – 8500 Area projects	3-17
Table 3.6-2c	Soils – 9700 Area projects	3-17
Table 3.6-2d	Soils – Flightline Area projects.....	3-17
Table 3.6-2e	Soils – Silver Flag Area projects	3-18
Table 3.6-2f	Soils – Support Area projects	3-18
Table 3.6-2g	Soils – Multi- Area projects.....	3-18

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>	<u>Page</u>
Table 3.7-1	Wetland and Other Surface Waters Identified in the Project Areas.....3-23
Table 3.8-1a	Land Use/Vegetative Cover – 2000 Area projects.....3-53
Table 3.8-1b	Land Use/Vegetative Cover – 8500 Area projects.....3-54
Table 3.8-1c	Land Use/Vegetative Cover – 9700 Area projects.....3-54
Table 3.8-1d	Land Use/Vegetative Cover – Flightline Area projects3-55
Table 3.8-1e	Land Use/Vegetative Cover – Silver Flag Area projects3-55
Table 3.8-1f	Land Use/Vegetative Cover – Support Area projects3-56
Table 3.8-1g	Land Use/Vegetative Cover – Multi- Area projects3-56
Table 3.8-2	Federally Listed Species Associated with Tyndall AFB3-60
Table 3.8-3	State-listed Species with Potential to Occur at Tyndall AFB3-67
Table 3.9-1	Cultural Chronology of Northwestern Florida.....3-70
Table 3.9-2	Previous Surveys Conducted Within 1.6 Kilometers (1 Mile) of the Project Survey Areas 3-72
Table 3.9-3	Previous Archaeological Sites Recorded Within 1.6 Kilometers (1 Mile) of the Project Survey Areas3-74
Table 3.10-1	IRP Sites within or Adjacent to EA Proposed Actions3-83
Table 4.1-1a	2020 Construction Phase Emissions4-3
Table 4.1-1b	2021 Construction Phase Emissions4-3
Table 4.1-1c	2022 Construction Phase Emissions4-4
Table 4.1-1d	2023 Construction Phase Emissions4-4
Table 4.1-1e	2024 Construction Phase Emissions4-4
Table 4.1-1f	2025 Construction Phase Emissions4-5
Table 4.1-1g	2026 Emissions (Steady State).....4-5
Table 4.2-1	Construction Equipment Noise Levels4-7
Table 4.4-1	Project Land Use and Land Use Compatibility Summary4-11
Table 4.5-1	Soil Types and Amounts.....4-14
Table 4.6-1	Uniform Mitigation Assessment Methodology (UMAM) Analysis of Wetland Impacts Resulting from the Proposed Actions4-16
Table 4.6-2	Florida Coastal Management Program Consistency Review.....4-17
Table 4.9-1	Estimated Demolition Debris from Proposed Actions.....4-31
Table 4.9-2	Potential Impacts to IRP Sites.....4-32
Table 4.11-1	Regional Projects Considered for Cumulative Impacts Analysis4-43
Table 4.11-2	Summary of Cumulative Impacts4-52

LIST OF FIGURES

Figure 1.1-1	Tyndall AFB Location Map.....1-2
Figure 1.4-1a	2000 Area Projects (Ballfields).....1-6
Figure 1.4-1b	2000 Area Constraints (Ballfields)1-7
Figure 1.4-1c	2000 Area Projects (Marina).....1-8
Figure 1.4-1d	2000 Area Constraints (Marina)1-9
Figure 1.4-2	8500 Area Projects.....1-11
Figure 1.4-2a	8500 Area Constraints1-12
Figure 1.4-3	9700 Area Projects.....1-14

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>	<u>Page</u>
Figure 1.4-3a	9700 Area Constraints 1-15
Figure 1.4-4a	Flightline Area Projects 1-18
Figure 1.4-4b	Flightline Area Constraints 1-19
Figure 1.4-4c	Flightline Area Projects (MSA Facilities) 1-20
Figure 1.4-4d	Flightline Area Constraints (MSA Facilities) 1-21
Figure 1.4-5	Silver Flag Area Projects 1-23
Figure 1.4-5a	Silver Flag Area Constraints 1-24
Figure 1.4-6	Support Area Projects 1-28
Figure 1.4-6a	Support Area Constraints 1-29
Figure 1.4-7a	Multi-Area Projects and Constraints (Airfield Drainage) 1-31
Figure 1.4-7b	Multi-Area Projects and Constraints (Site Development and Utilities) 1-32
Figure 1.4-7c	Multi-Area Projects (Building Demolitions) 1-33
Figure 2.3-1	Flightline Area Projects: Alternative A 2-6
Figure 2.3-1a	Flightline Area Constraints: Alternative A 2-7
Figure 2.3-2	Flightline Area Projects: Alternative B 2-8
Figure 2.3-2a	Flightline Area Constraints: Alternative B 2-9
Figure 2.3-3	Support Area Projects and Constraints: Alternative A 2-12
Figure 2.3-4	Support Area Projects and Constraints: Alternative B 2-13
Figure 2.3-5	9700 Area Project Alternatives Location Map 2-18
Figure 2.3-6	9700 Area Projects and Constraints: Alternative A 2-19
Figure 2.3-7	9700 Area Projects and Constraints: Alternative B 2-20
Figure 2.3-8	9700 Area Projects and Constraints: Alternative C 2-21
Figure 2.3-9	9700 Area Projects and Constraints: Alternative D 2-22
Figure 3.5-1	Planning Districts 3-13
Figure 3.7-1a	Wetlands and Other Surface Waters 2000 Area (Marina) 3-27
Figure 3.7-1b	Wetlands and Other Surface Waters 2000 Area (Ballfields) 3-28
Figure 3.7-1c	Wetlands and Other Surface Waters 8500 Area 3-29
Figure 3.7-1d	Wetlands and Other Surface Waters 9700 Area 3-30
Figure 3.7-1e	Wetlands and Other Surface Waters Flightline Area 3-31
Figure 3.7-1f	Wetlands and Other Surface Waters Flightline Area (MSA) 3-32
Figure 3.7-1g	Wetlands and Other Surface Waters Silver Flag Area 3-33
Figure 3.7-1h	Wetlands and Other Surface Waters Support Area 3-34
Figure 3.7-1i	Wetlands and Other Surface Waters Multi-Area Projects (Airfield Drainage) 3-35
Figure 3.7-1j	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-36
Figure 3.7-1k	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-37
Figure 3.7-1l	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-38
Figure 3.7-1m	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-39
Figure 3.7-1n	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-40
Figure 3.7-1o	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-41
Figure 3.7-1p	Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor) 3-42
Figure 3.7-2a	Floodplains 2000 Area (Marina) 3-44
Figure 3.7-2b	Floodplains 2000 Area (Ballfields) 3-45
Figure 3.7-2c	Floodplains 8500 Area 3-46
Figure 3.7-2d	Floodplains 9700 Area 3-47

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE OF CONTENTS (CONTINUED)

<u>Chapter</u>	<u>Page</u>
Figure 3.7-2e Floodplains Flightline Area	3-48
Figure 3.7-2f Floodplains Support Area	3-49
Figure 3.7-2g Floodplains Multi-Area Projects (Airfield Drainage)	3-50
Figure 3.7-2h Floodplains Multi-Area Projects (Utility Corridor)	3-51
Figure 3.9-1 Tyndall AFB Project Cultural Resources Project Areas	3-71

LIST OF APPENDICES

APPENDIX A	List of Buildings to be Demolished
APPENDIX B	Agency Coordination and Public Involvement
Appendix B.1	Early Agency Notification
Appendix B.2	Notice of Availability of Draft EA and Agency Correspondence
APPENDIX C	Biological Assessment
APPENDIX D	Cultural Resources Survey Reports
APPENDIX E	Air Conformity Applicability Model Report

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

The 325th Fighter Wing (325 FW) at Tyndall Air Force Base (AFB), in conjunction with Headquarters Air Combat Command (HQ ACC) and the Tyndall Program Management Office (PMO) established by the Air Force Installation and Missions Support Center (AFIMSC), has identified and programmed urgent reconstruction and development project needs at Tyndall AFB (i.e., Proposed Actions), which are expected to be implemented over the next five years (Calendar Year 2020– Calendar Year 2025). The mission recovery will consist of construction of new facilities and infrastructure, renovations, consolidation, and demolition as well as management of natural resources.

This Environmental Assessment (EA) was prepared to evaluate the potential environmental impacts of these proposed projects in compliance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [U.S.C.] 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 U.S. Air Force (Air Force) Environmental Impact Analysis Process (EIAP) Regulations at 32 CFR Part 989, and Air Force Instruction (AFI) 32-7061.

Tyndall AFB occupies approximately 29,276 acres in Bay County, Florida, approximately 13 miles southeast of Panama City (**Figure 1.1-1**). Over 30 organizations operate at Tyndall AFB including the 325 FW, the First Air Force, the 53rd Weapons Evaluation Group (53 WEG), and the Air Force Civil Engineer Center (AFCEC).

On October 10, 2018 Tyndall AFB sustained a direct hit from Hurricane Michael, a category five hurricane with wind speeds in excess of 156 miles per hour. This was the strongest sustained wind hurricane to hit the continental United States in over 25 years. Every facility on the installation sustained at least some damage with more than 50 percent of the facilities significantly damaged. Hurricane Michael caused extensive damage to Tyndall AFB facilities, infrastructure and environmental conditions (natural resources management areas) base-wide, which impacted mission capabilities and significantly altered baseline conditions.

With this EA, the intent of the 325 FW and HQ ACC is to streamline NEPA compliance and facilitate the rapid reconstruction of the installation by evaluating in one integrated document the potential impacts on the human environment of the projects proposed for execution at Tyndall AFB. These projects are presented in **Section 1.4**.



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

Location Map

**Figure
1.1-1**

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

As part of the recovery effort, emergency actions were enacted. The Air Force consulted with the CEQ to identify emergency alternative arrangements to comply with NEPA and restore training operations as quickly as possible. The alternative arrangements were approved and accepted in December of 2018. The only Air Force F-22A Formal Training Unit (FTU) was temporarily relocated from Tyndall AFB to Eglin AFB under a Special EA. The Air Force is currently evaluating whether to permanently relocate the F-22A FTU to either Langley AFB or to continue to operate it from Eglin AFB. The Proposed Actions addressed in this EA, which pertains to the reconstruction of Tyndall AFB due to damage incurred from Hurricane Michael, is unrelated to the F-22 activities, and the potential permanent F-22 relocation to another facility is independent of this Proposed Actions covered in this EA. Therefore, the proposed permanent F-22 relocation will be addressed under a separate NEPA document.

The information presented in this document will serve as the basis for deciding whether the Proposed Actions 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 Actions would involve “construction” in a wetland as defined in Executive Order (EO) 11990, *Protection of Wetlands*, or “action” in a floodplain under EO 11988, *Floodplain Management*, a Finding of No Practicable Alternative would be prepared in conjunction with the FONSI.

1.2 BACKGROUND

Installation development and proposed reconstruction actions at Tyndall AFB should be accomplished in accordance with the Air Force Comprehensive Planning Program established in AFI 32-1015, *Integrated Installation Planning*. Comprehensive Planning establishes a systematic framework for informing decision-making on the physical development of Air Force installations and their environment. The objective of the Comprehensive Planning Process is to synthesize data and information to enable commanders to make effective development decisions affecting their installation and the surrounding community. As a part of the Comprehensive Planning Process, installations are divided into identifiable planning areas based on geographical features, land use patterns, building types, and/or transportation networks. Within these planning areas, the Base Community Planner identifies shortfalls in the existing capability, capacity, or relationship of installation resources with respect to their contribution to successful accomplishment of installation missions. A thorough analysis of the existing conditions, a study of the requirements, and the vision, goals, and objectives of the installation allow the development of conceptual alternatives. These alternatives are evaluated against measurable criteria/selection standards and evaluated during the EIAP. So, the planning activities required by the Comprehensive Planning Process must integrate EIAP to ensure planning decisions reflect environmental values, identify alternatives to be considered, and document the rationale for dismissed alternatives.

1.3 PURPOSE AND NEED

The purpose of implementing the installation development projects at Tyndall AFB is to recover mission capabilities at Tyndall AFB, impacted by Hurricane Michael. The impact of the hurricane caused extensive damage to the base’s mission, facilities, infrastructure and natural resources areas. The Proposed Actions would include construction of new facilities and infrastructure, renovations, consolidation, and demolition as well as management of natural resources to restore mission capabilities.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

The need for the Proposed Actions is to rebuild Tyndall AFB to a fully operational base, thereby providing new facilities/infrastructure, as well as executing repair, demolition and functionality improvements necessary to support the 325 FW mission and tenant units. Installation development projects must be developed in a manner that:

- Supports the Air Force mission requirements and quality of life of units and Airmen hosted by the installation;
- Meets all applicable Department of Defense (DoD), Federal, state, and local laws and regulations, such as but not limited to the Endangered Species Act (ESA), National Historic Preservation Act (NHPA), Clean Water Act (CWA), Clean Air Act (CAA), Resource Conservation and Recovery Act, and Migratory Bird Treaty Act (MBTA). More detailed information regarding resource-specific laws and regulations is provided in the specific resource sections of this EA;
- Provides reliable utilities and an efficient transportation system to support Tyndall AFB and meets current Air Force requirements for functional space, consistent with Air Force Manual (AFMAN) 32-1084, *Facility Requirements*;
- Reduces the consumption of fuel, energy, water, and other resources, maximizes the use of existing facilities, and reduces the footprint of unnecessary or redundant facilities and infrastructure;
- Supports and enhances the morale and welfare of personnel assigned to the installation, their families, and civilian staff, consistent with Department of Defense Instruction (DoDI) 1015.10, *Military Morale, Welfare, and Recreation Programs* (6 July 2009); and
- Meets applicable DoD antiterrorism/force protection criteria, consistent with Unified Facilities Criteria (UFC) 4-010-01, *Department of Defense Minimum Antiterrorism Standards for Buildings* and the Air Force Installation Force Protection Guide.

1.4 PROJECTS IDENTIFIED FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

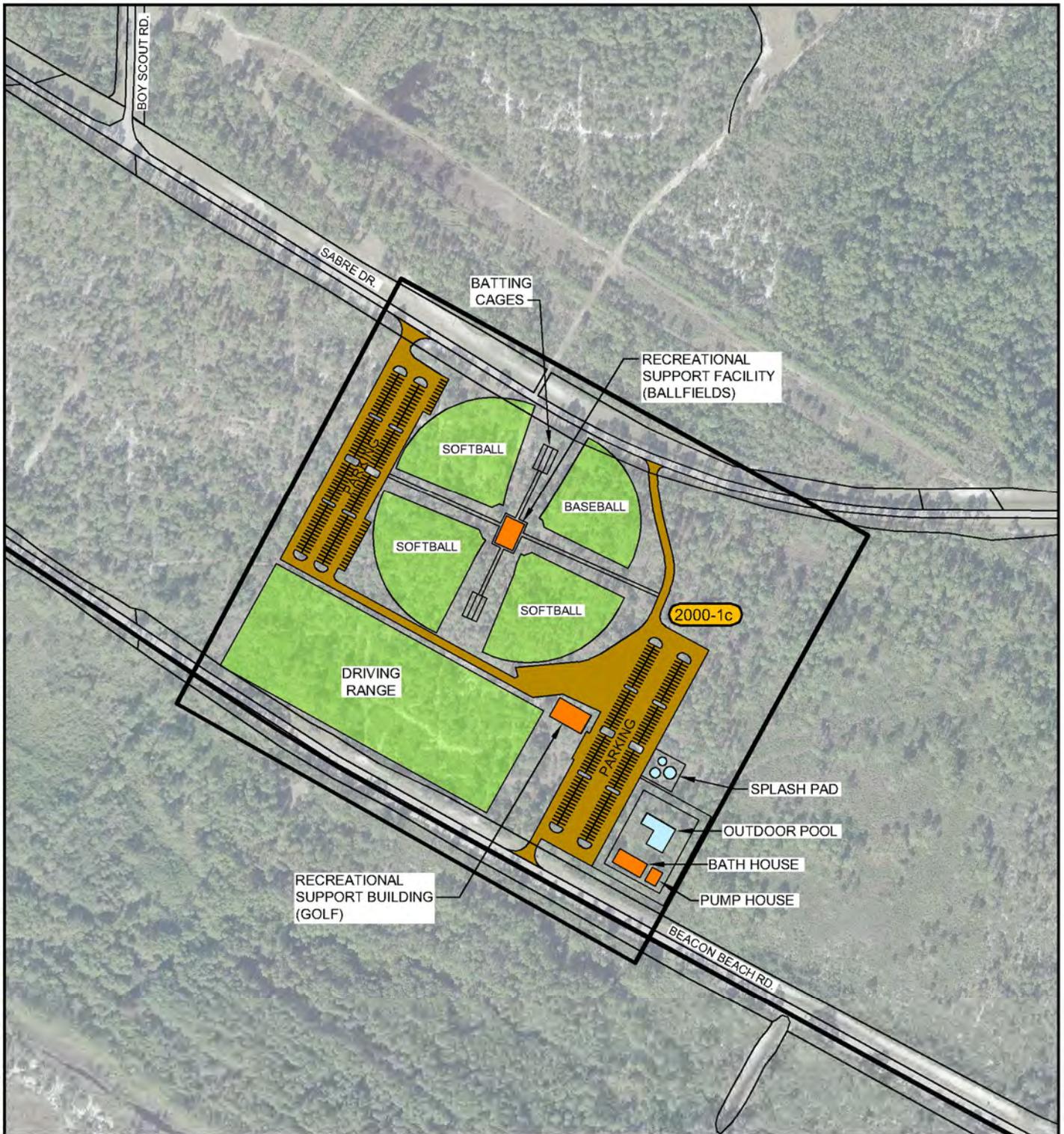
Based on the established purpose and need for the Proposed Actions, Tyndall AFB has identified and programmed 28 individual projects spanning six planning areas throughout the installation. Three additional projects have been identified which cover more than one planning area, hereinafter referred to as “Multi-Area projects”. **Tables 1.4-1** through **1.4-7** list all projects identified for this EA across each planning area, and these projects are also depicted graphically on **Figures 1.4-1** through **1.4-7**. Constraints associated with each project area are also shown on these figures. Of note, demolition requirements associated within each planning development area are identified in **Figure 1.4-7c** and are associated with the base-wide demolition list in **Appendix A**.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

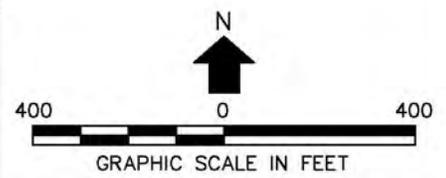
TABLE 1.4-1 2000 AREA DEVELOPMENT

Project ID	Project Name	Description of Project	Anticipated Timeframe
2000-1a 2000-1b 2000-1c	Morale, Welfare and Recreation Facilities	<p>Construct morale, welfare, and recreation (MWR) facilities at the Marina and at a new recreation area. Marina facilities include pavilions (4,250 square feet [SF]), boat slips, floating pier, recreation center (42,728 SF), restrooms (680 SF) and a bath house (372 SF). Approximately 98,005 SF of parking area and 1,778 feet of dry storage fencing would also be installed.</p> <p>Recreational facilities include courts and athletic fields, pavilions and picnic areas, support facilities (5,983 SF), playground, outdoor swimming pool and driving range. Includes 290,381 SF of parking area, 12,321 SF of sidewalk and two slabs totaling 6,337 SF in size. Collectively these facilities support service members and dependents and fulfill base requirement for MWR facilities.</p>	Sept 2023- Sept 2025

Source: Tyndall AFB, 2019b.



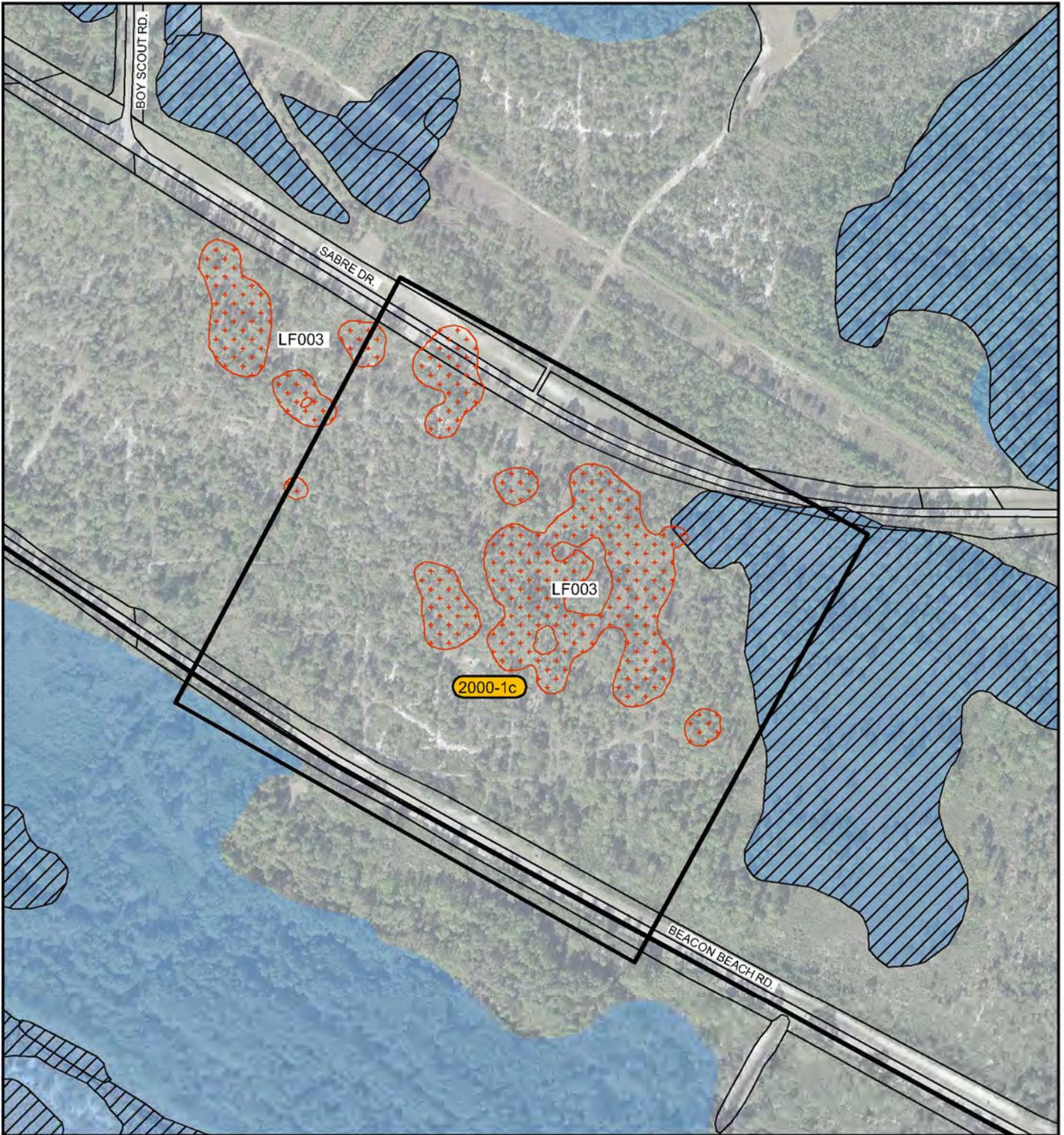
LEGEND	
MORALE, WELFARE AND RECREATION FACILITIES:	
	BALLFIELD AREA
	PROJECT AREA
	NEW BUILDING
	NEW ROADS / PARKING
	NEW DRIVING RANGE & SOFTBALL / BASEBALL FIELDS
	POOL / SPLASH PAD



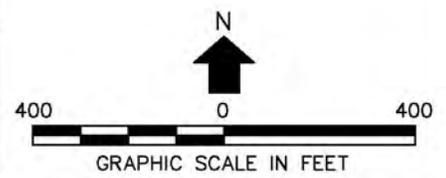

Tyndall Air Force Base, Panama City FL
**ENVIRONMENTAL ASSESSMENT
 FOR HURRICANE RECOVERY AND
 INSTALLATION DEVELOPMENT**

**2000 AREA PROJECTS
 (BALLFIELDS)**

**FIGURE
 1.4-1a**



LEGEND	
	MORALE, WELFARE AND RECREATION FACILITIES: BALLFIELD AREA
	PROJECT AREA
	FLOODPLAIN
	WETLAND
	CLOSED RESTORATION SITE NO FURTHER ACTION



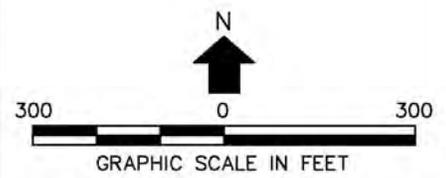

Tyndall Air Force Base, Panama City FL
**ENVIRONMENTAL ASSESSMENT
 FOR HURRICANE RECOVERY AND
 INSTALLATION DEVELOPMENT**

**2000 AREA CONSTRAINTS
 (BALLFIELDS)**

**FIGURE
 1.4-1b**



LEGEND	
MORALE, WELFARE AND RECREATION FACILITIES:	
	MARINA AREA NORTH
	MARINA AREA SOUTH
	PROJECT AREA
	NEW BUILDING / STRUCTURE
	BUILDING / STRUCTURE DEMOLISHED
	FUTURE PARKING



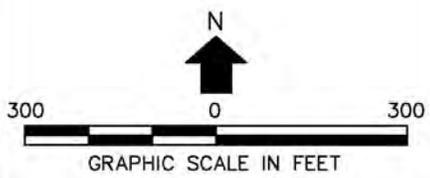

Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

2000 AREA PROJECTS (MARINA)

FIGURE 1.4-1c



LEGEND	
MORALE, WELFARE AND RECREATION FACILITIES:	
2000-1a	MARINA AREA NORTH
2000-1b	MARINA AREA SOUTH
	PROJECT AREA
	BUILDING/STRUCTURE DEMOLISHED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION




Tyndall Air Force Base, Panama City FL
**ENVIRONMENTAL ASSESSMENT
 FOR HURRICANE RECOVERY AND
 INSTALLATION DEVELOPMENT**

**2000 AREA CONSTRAINTS
 (MARINA)**

FIGURE
 1.4-1d

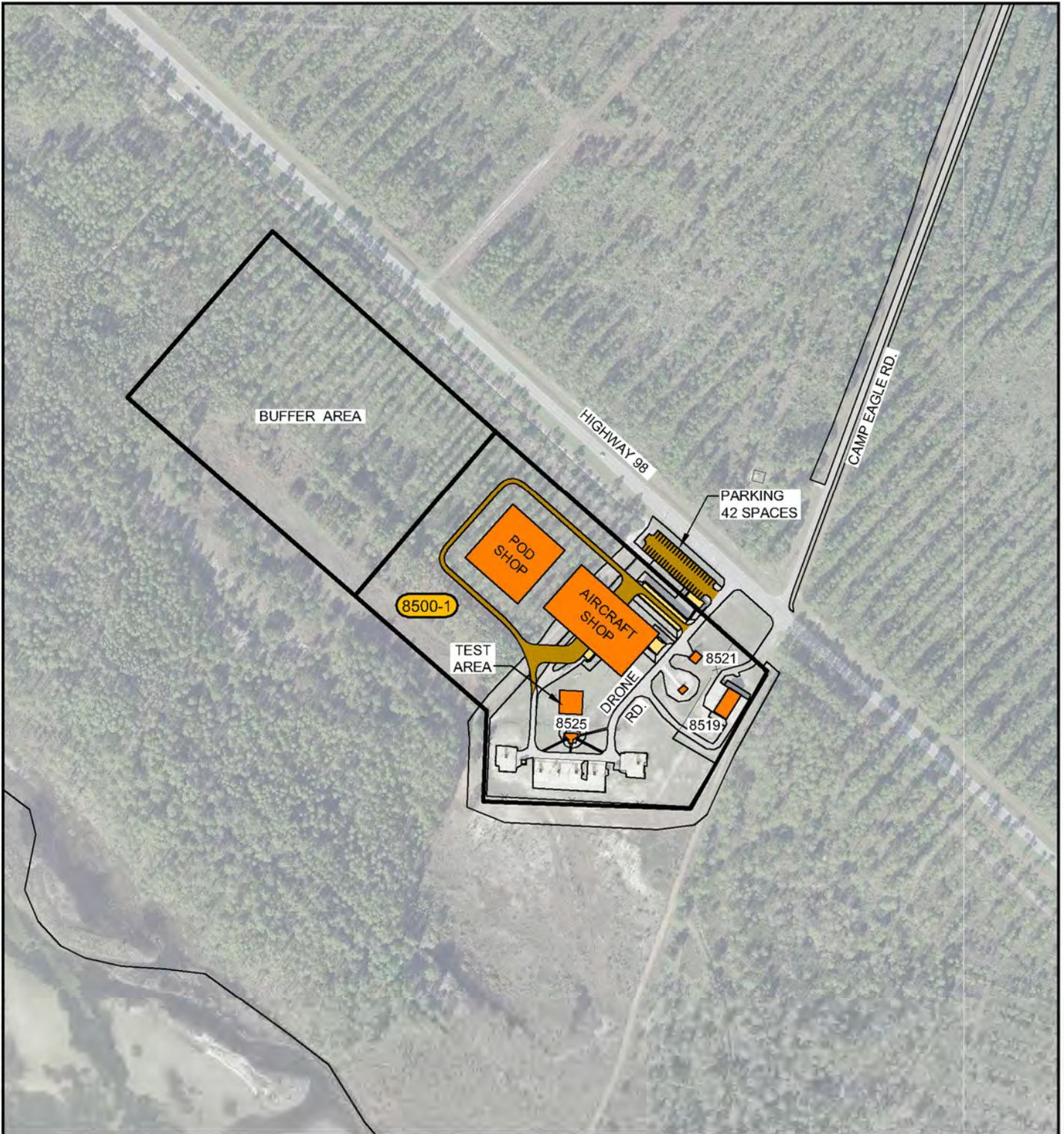
**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 1.4-2 8500 AREA DEVELOPMENT

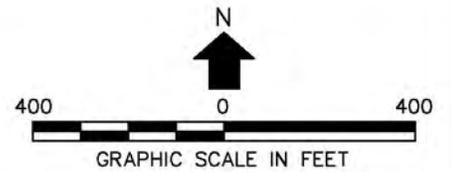
Project ID	Project Name	Description of Project	Anticipated Timeframe
8500-1	53 WEG Subscale Drone Facility	Construct a Subscale Drone facility complex with pilotless aircraft shops (50,870 SF), Electronic Counter Measure pod shops and storage (38,763), engine test cell (4,200 SF), chute shop (23,463 SF), and wash rack (2,588 SF). Approximately 15,950 SF of roadway would be demolished to accommodate facility construction, and replaced with approximately 31,429 SF of roadway. Similarly, approximately 8,284 SF of parking/pavement area would be demolished and replaced with 15,911 SF of new impervious area.	Sept 2023 – Sept 2025

Source: Tyndall AFB, 2019b.

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25--SKETCHES\Exhibits\FIG 1.4--2.dwg 10/10/2019 13:25



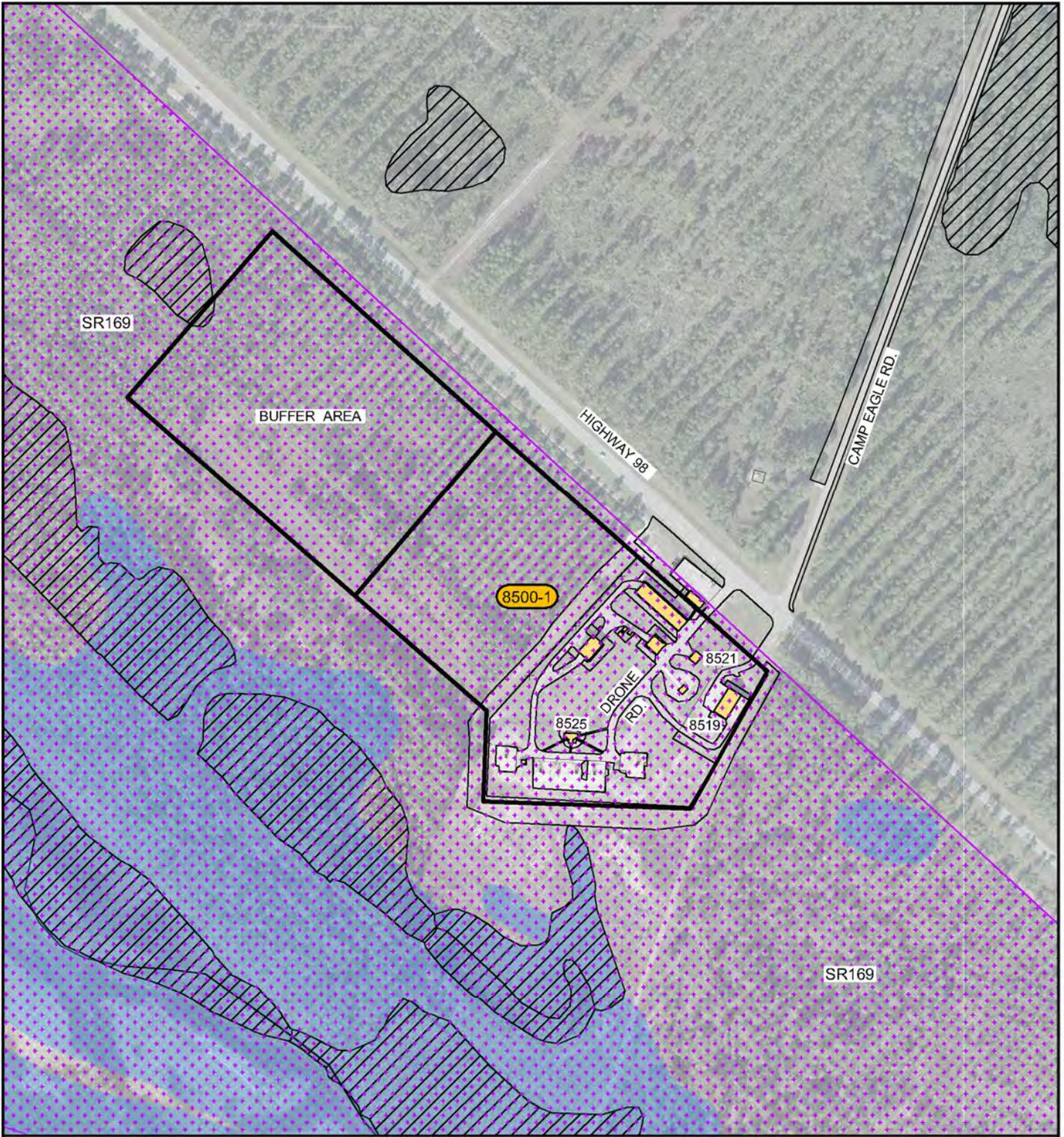
LEGEND	
	53 WEG SUBSCALE DRONE FACILITY
	PROJECT AREA
	NEW BUILDING
	BUILDING / STRUCTURE TO BE REMOVED
	FUTURE ROAD / PARKING



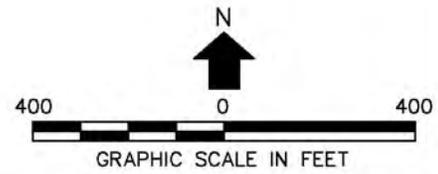
Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

8500 AREA PROJECTS

FIGURE 1.4-2



LEGEND	
	53 WEG SUBSCALE DRONE FACILITY
	PROJECT AREA
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE



Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

8500 AREA CONSTRAINTS

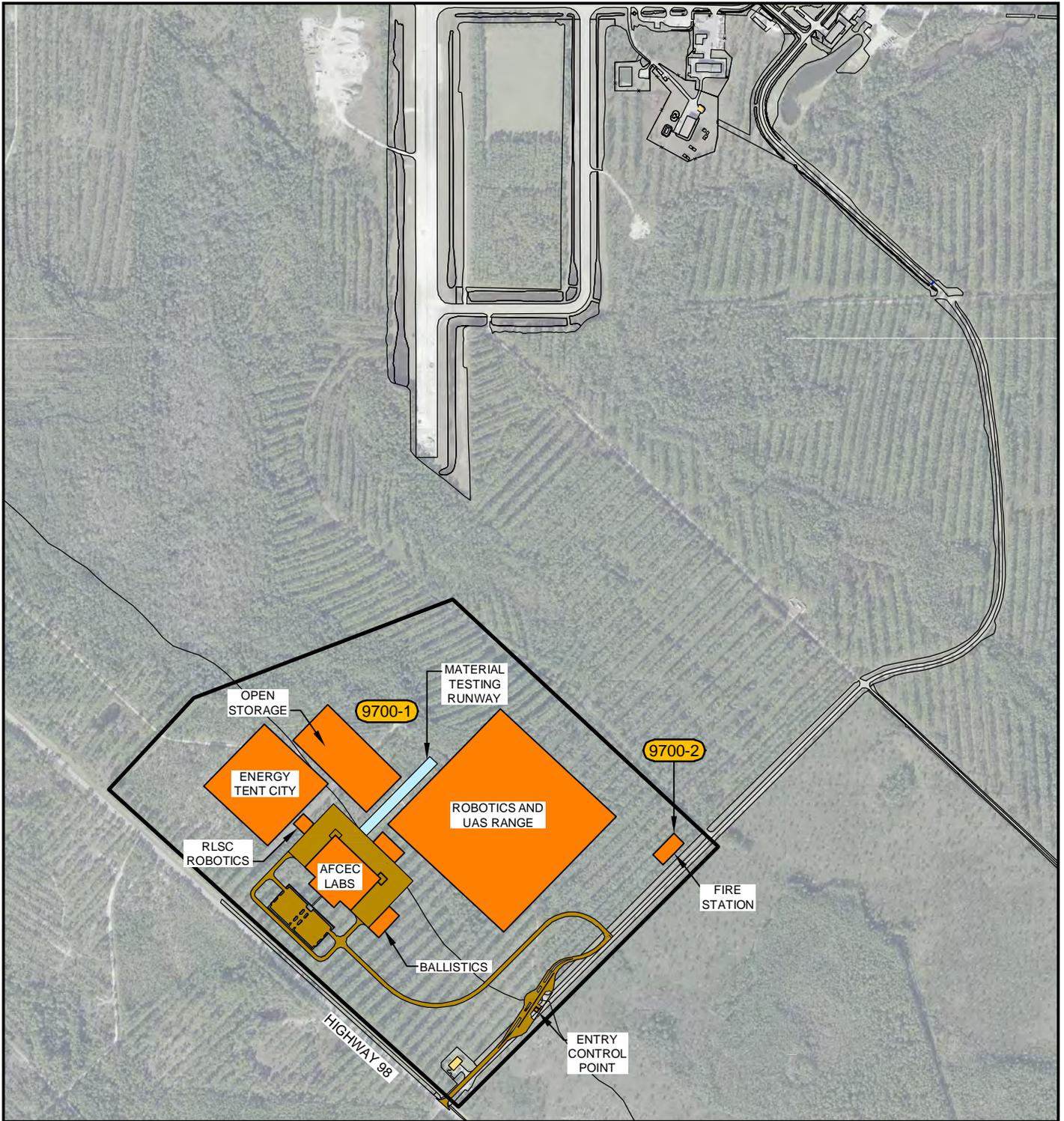
FIGURE 1.4-2a

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

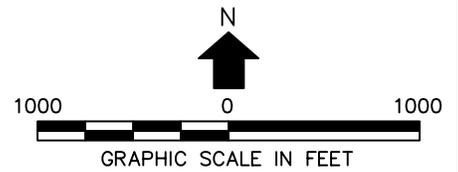
TABLE 1.4-3 9700 AREA DEVELOPMENT

Project ID	Project Name	Description of Project	Anticipated Timeframe
9700-1	AFCEC RDT&E Facilities and Gate	Construct AFCEC Research, Development, Testing & Evaluation (RDT&E) Facilities, including: RDT&E Research Facility (135,120 SF); AFCEC Firefighting Research and Development (R&D) Facility (17,437 SF); Ballistics Lab (11,000 SF); Vehicle Maintenance Facility (12,540 SF); Heavy Equipment Storage (5,500 SF); Cyber Operations Building (22,000 SF); Civil Engineer (CE) Materials Testing Runway Support Building (2,750 SF); Robotics Range Control Support Building (27,500 SF); Energy and Utility Range Control Support Buildings (1,100 SF); Materials Testing Runway (75,000 SF); Robotics Storage Range (200,000 SF); Gate and Lane Houses (512 SF); Vehicle Inspection Port (1,763 SF) with Canopy (3,201 SF). Perimeter Fencing (11,000 linear feet [LF]), and five active and passive barriers would also be constructed, along with approximately 34,800 SF of access roadway.	Sept 2023 – Sept 2025
9700-2	Fire Station #4	Construct a 6,356 SF two bay, satellite firefighting vehicle station to meet response times to the Silver Flag Training Area and AFCEC RDT&E Facilities.	Sept 2023 – Sept 2025

Source: Tyndall AFB, 2019b.



LEGEND	
	AFCEC RDT&E FACILITIES AND GATE
	FIRE STATION #4
	PROJECT AREA
	NEW BUILDING
	BUILDING / STRUCTURE TO BE REMOVED
	NEW ROAD / PARKING

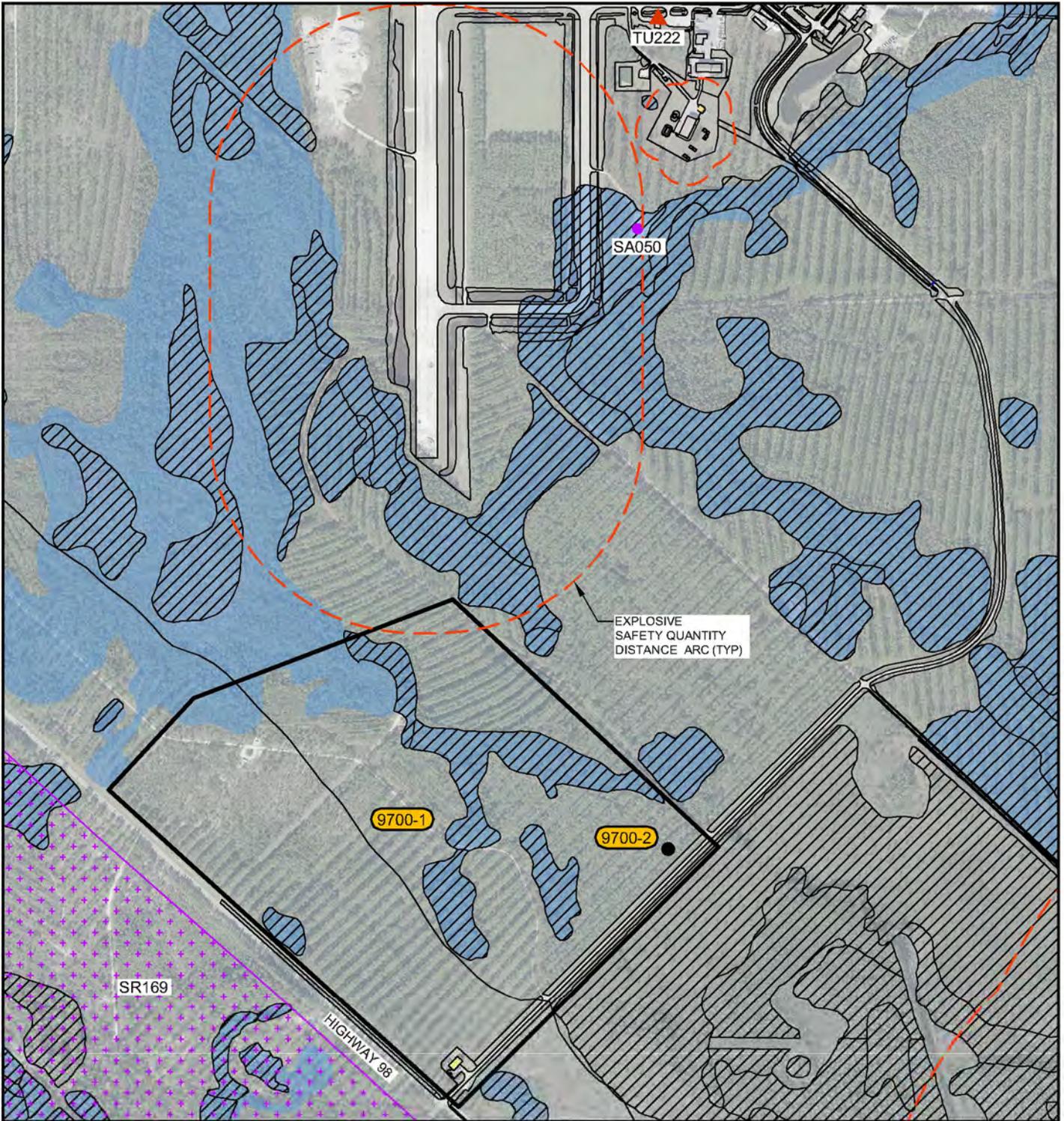


Tyndall Air Force Base, Panama City FL
 ENVIRONMENTAL ASSESSMENT
 FOR HURRICANE RECOVERY AND
 INSTALLATION DEVELOPMENT

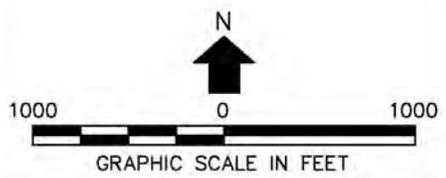
9700 AREA PROJECTS

FIGURE
 1.4-3

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25--SKETCHES\Exhibits\FIG 1.4--3a.dwg 10/18/2019 13:17



LEGEND	
	AFCEC RDT&E FACILITIES AND GATE
	FIRE STATION #4
	PROJECT AREA
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION



Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

9700 AREA CONSTRAINTS

FIGURE 1.4-3a

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 1.4-4 FLIGHTLINE AREA DEVELOPMENT

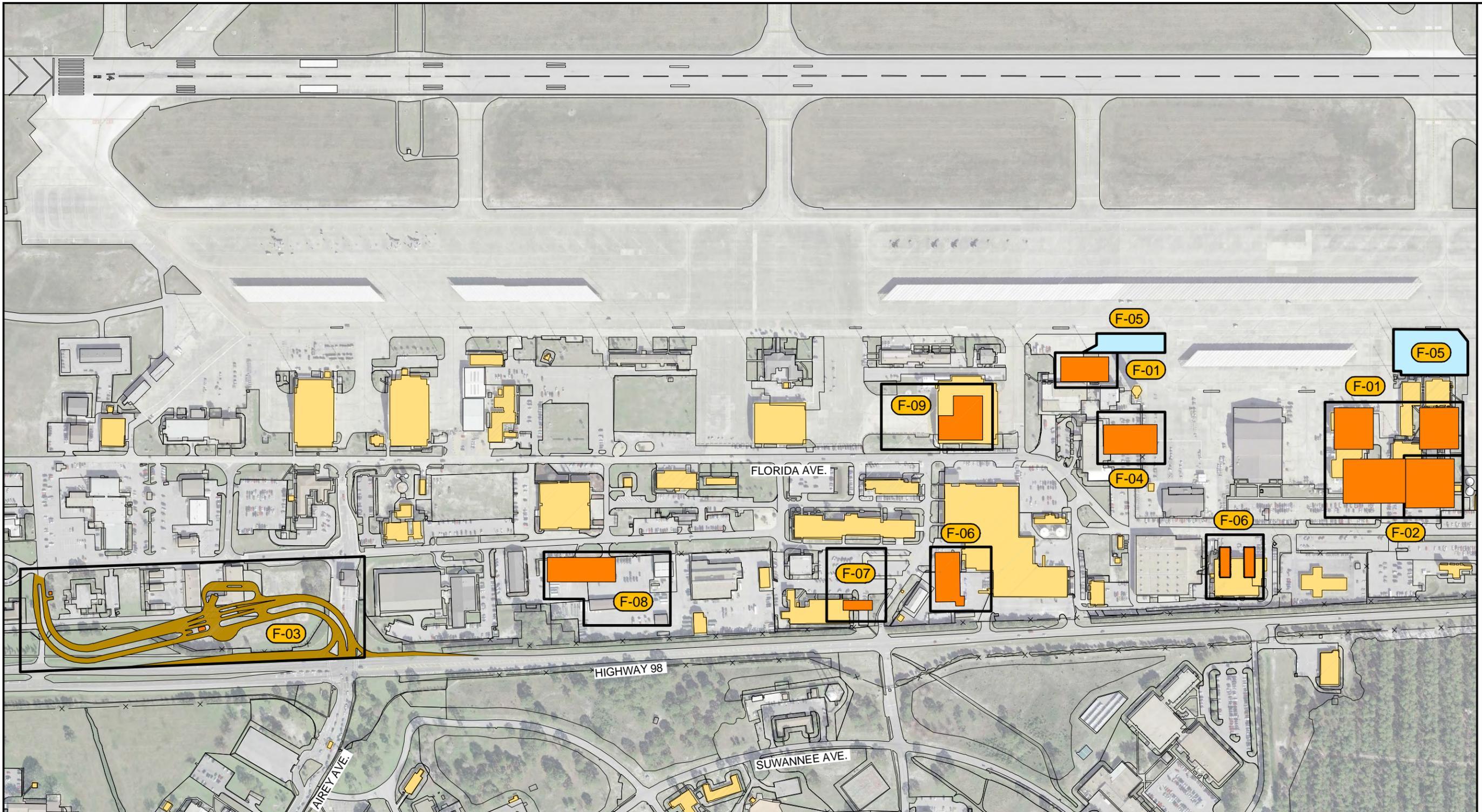
Project ID	Project Name	Description of Project	Anticipated Timeframe
F-01	53 WEG Hangar	Construct an Aircraft Maintenance Hangar and associated facilities for the 53 WEG. Proposed facility construction includes a QF-16 Aircraft Maintenance Shop (15,434 SF), Armament Research Testing facilities (1,610 SF), Maintenance Hangar (94,898 SF), Aircraft Corrosion Control facilities (9,200 SF), and a Fuel Systems Maintenance Dock (13,380 SF).	July 2021 – May 2022
F-02	53 WEG HQ Facility	Construct a consolidated facility with administrative and operations areas for the 53rd Test Support Squadron, 53 WEG, and 83rd Squadron Operations staff. The administrative areas include conferencing, meeting, and other special spaces. The squadron operations areas would provide mission planning, Sensitive Compartmented Information Facility workspace, briefing, storage, and vault space. Temporary Duty maintenance bays would also be provided. Overall, proposed facilities total 9,632 SF of Group Headquarters (HQ) facilities, 39,367 SF of Squadron Operations facilities, and 26,394 SF of Sensitive Compartmented Information Facility space.	Sept 2023 – Sept 2025
F-03	Tyndall AFB Gate Complexes (Flightline)	<u>Airey Gate (Flightline)</u> : Entry access, includes one Gate House (500 SF), two Lane Houses (900 SF), five lanes (three in and two out) and five active/passive barriers for the protection of restricted or controlled areas. Supporting facilities include a canopy and overwatch facility; 5,400 SF total. The perimeter fence will span the site of the gates' primary and supporting facilities and will be 11,000 LF. Approximately 62,212 SF of pavement area and 83,743 SF of roadway would be demolished to enable installation of approximately 144,436 SF of proposed access roadway area.	July 2021 – Sept 2021
F-04	OSS Facility	Construct a consolidated Operations Support Squadron (OSS) Facility to support the 53 WEG in three main functions: Base Operations (12,041 SF), Transient Alert (12,370 SF), and Radar Approach Control Center (9,784 SF).	Sept 2023 – Aug 2024
F-05	WEG Parking Apron	Approximately 13,691 square yards (SY) of pavement is required to support the Weapons Evaluation Group (WEG) aircraft and provide area for aircraft operations outside of the obstruction free area. Parking aprons provide aircraft parking, servicing, and loading capabilities. Apron lighting is also provided to support nighttime maintenance activities on the apron. The additional pavement allows access to the hangars and maintenance facilities as well as provides adequate space for taxi lanes with pull through parking. The extension of the parking apron is also required to move aircraft out of the live ordnance loading area and the taxiway obstruction free areas to reduce the need for waivers and the associated hazards with operating in those areas.	July 2021 – May 2022
F-06	Aerospace & Operational Physiology Facility	Construct an Aerospace Operations and Physiology as well as an Aircrew Flight and Equipment Shop, collectively totaling approximately 11,658 SF. The facility provides highly specialized training areas including an altitude chamber, pump and oxygen room, recovery room, and reduced oxygen breathing device room. Assembly and administrative areas are also required.	Sept 2023 – April 2025
F-07	Special Purpose Vehicle Maintenance	Construct two Vehicle Maintenance Facilities to support refueling vehicles, fire trucks and material handling equipment (MHE). The facilities include a Refueler Maintenance facility (8,231 SF) and a Vehicle Maintenance Fire and MHE facility (11,994 SF). For	July 2021 – July 2023

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project ID	Project Name	Description of Project	Anticipated Timeframe
		efficiency and safety, the Refueler Maintenance facility will be located in the refueler parking area and service the R-11s and C-300 refueling vehicles. The Fire and MHE Maintenance Facility, located on the flight line, will service approximately 60 pieces of MHE and 14 fire trucks.	
F-08	Operations Group/ Maintenance Group HQ	Construct a combined Operations, Maintenance, and Reserve Group HQ, totaling approximately 31,027 SF, for the 325th Operations Group, Maintenance Group, and Mission Support Group.	July 2021 – Jan 2022
F-09	Deployment Center/Flight Line Dining/AAFES	Construct a Deployment Center/Flight Line Dining/Army and Air Force Exchange Service (AAFES) facility to provide space for receiving and processing personnel and baggage, kitchen, dining, and sales services. Proposed facility construction includes a Deployment Processing Center (37,362 SF), Secure Cargo Yard (123,850 SF), Flight Kitchen/Dining Facility (5,995 SF), AAFES Shoppette (1,076 SF), and an AAFES Barbershop (323 SF).	Sept 2023 – Sept 2025
F-10	Flightline – MSA Facilities, 7000 Area	Construct new facilities and renovate existing Munition Storage Area (MSA) facilities. Proposed facility construction includes: Above Ground Magazines (20,000 SF); Conventional Munitions Shop (19,085 SF); Ancillary Explosive Facilities (16,980 SF); Administration Facilities (7,580 SF); and Air Supply Equipment Shop/Storage Facility Pad (5,400 SF). The facilities will include administration, maintenance bays and a concrete pad. Improvements include resurfacing and striping the entire parking area to accommodate up to 76 cars and construction of a new egress road to correct a life-safety deficiency. Otherwise, several facilities that were damaged may be reused after renovations: Missile Maintenance (Building 7028, 11,975 SF), Countermeasures (Building 7024, 1,980 SF), Administrative (Building 7032, 2,534 SF and Building 7052, 5,046 SF). Repairs may include re-roofing, door and window replacements, mechanical and electrical replacements and interior fit-outs.	July 2021 – Apr 2023

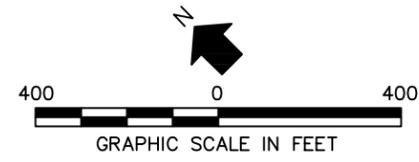
Source: Tyndall AFB, 2019b.

This page intentionally left blank.



PROPOSED PROJECTS	
F-01 53 WEG HANGAR	F-06 AEROSPACE AND OPERATIONAL PHYSIOLOGY FACILITY
F-02 53 WEG HQ FACILITY	F-07 SPECIAL PURPOSE VEHICLE MAINTENANCE
F-03 TYNDALL AFB GATE COMPLEXES (FLIGHTLINE)	F-08 OPERATIONS GROUP / MAINTENANCE GROUP HQ
F-04 OSS FACILITY	F-09 DEPLOYMENT CENTER / FLIGHTLINE DINING / AAFES
F-05 WEG PARKING APRON	

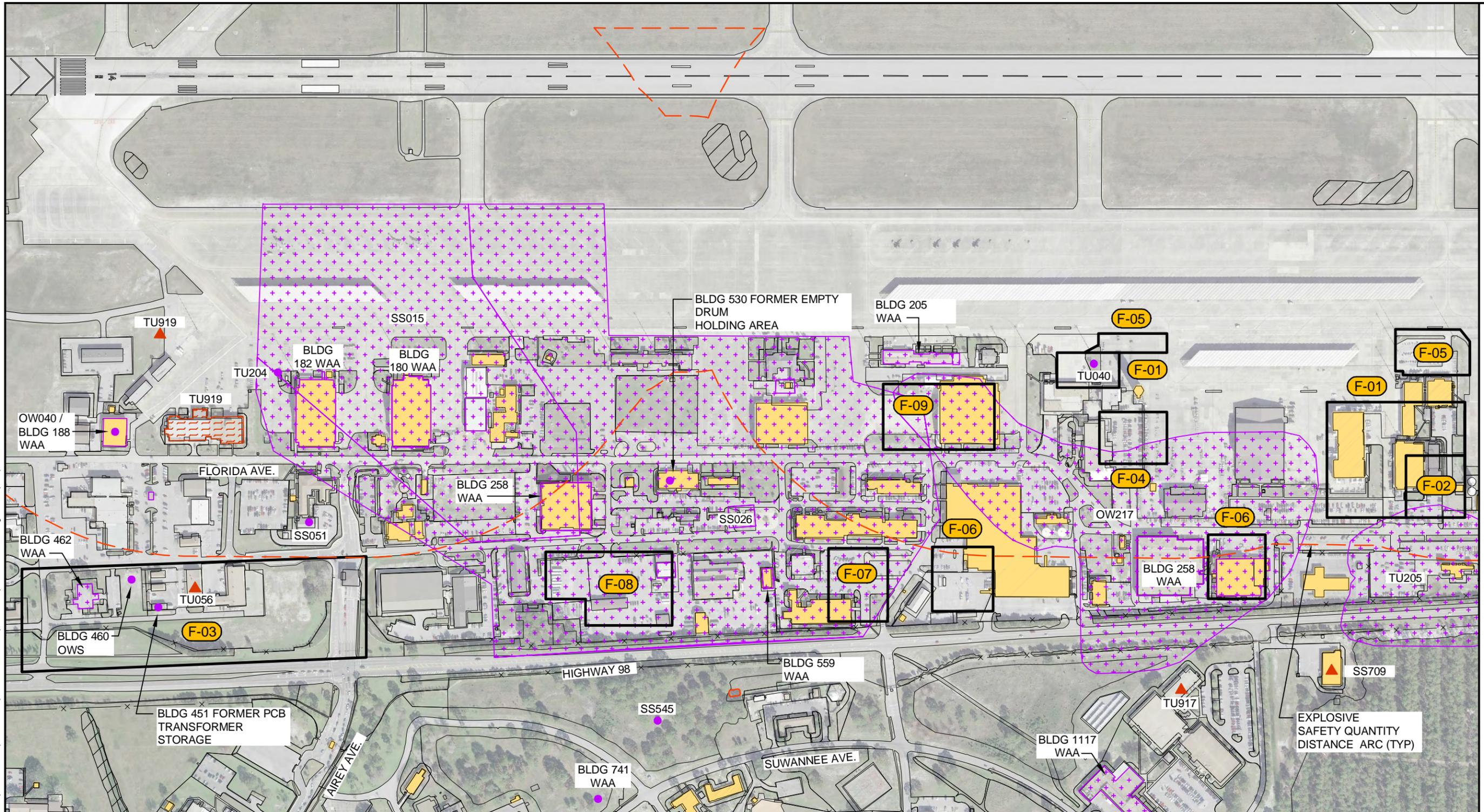
LEGEND	
	PROJECT AREA
	NEW BUILDING
	NEW ROADS
	NEW AIRCRAFT PARKING APRON
	BUILDING / STRUCTURE TO BE REMOVED



FLIGHTLINE AREA PROJECTS

FIGURE 1.4-4a

S:\Projects\G\GSR\60610846 Tyndall AFB EA 900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 1.4-4b.dwg 10/18/2019 13:27

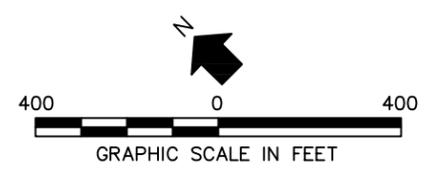


PROPOSED PROJECTS

- | | |
|-----------------------------------------------------|-----------------------------------------------------------|
| F-01 53 WEG HANGAR | F-06 AEROSPACE AND OPERATIONAL PHYSIOLOGY FACILITY |
| F-02 53 WEG HQ FACILITY | F-07 SPECIAL PURPOSE VEHICLE MAINTENANCE |
| F-03 TYNDALL AFB GATE COMPLEXES (FLIGHTLINE) | F-08 OPERATIONS GROUP / MAINTENANCE GROUP HQ |
| F-04 OSS FACILITY | F-09 DEPLOYMENT CENTER / FLIGHTLINE DINING / AAFES |
| F-05 WEG PARKING APRON | |

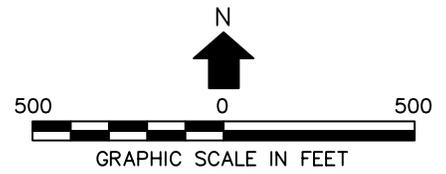
LEGEND

- | | |
|------------------------------------|-------------------------------------------|
| PROJECT AREA | ACTIVE RESTORATION SITE |
| BUILDING / STRUCTURE TO BE REMOVED | CLOSED RESTORATION SITE NO FURTHER ACTION |
| WETLAND | |





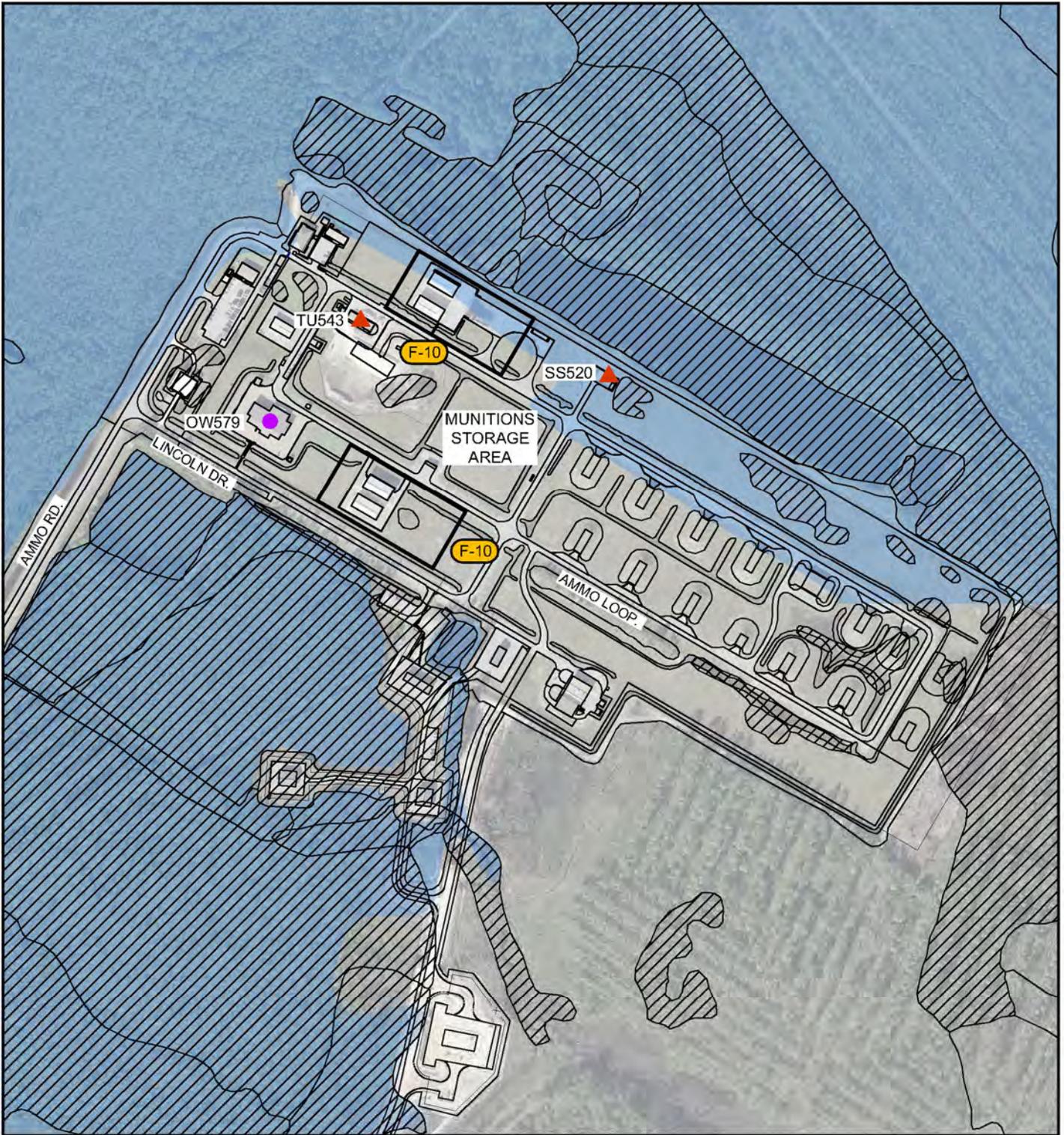
LEGEND	
	FLIGHTLINE - MSA FACILITIES, 7000 AREA
	PROJECT AREA
	NEW BUILDING
	BUILDING / STRUCTURE TO BE REMOVED



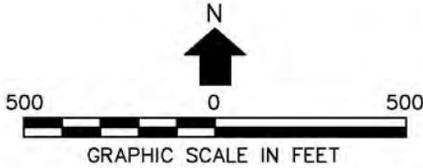
Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT

FLIGHTLINE AREA PROJECTS (MSA FACILITIES)

FIGURE
1.4-4c



LEGEND	
	FLIGHTLINE - MSA FACILITIES, 7000 AREA
	PROJECT AREA
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION



Tyndall Air Force Base, Panama City FL
**ENVIRONMENTAL ASSESSMENT
 FOR HURRICANE RECOVERY AND
 INSTALLATION DEVELOPMENT**

**FLIGHTLINE AREA
 CONSTRAINTS
 (MSA FACILITIES)**

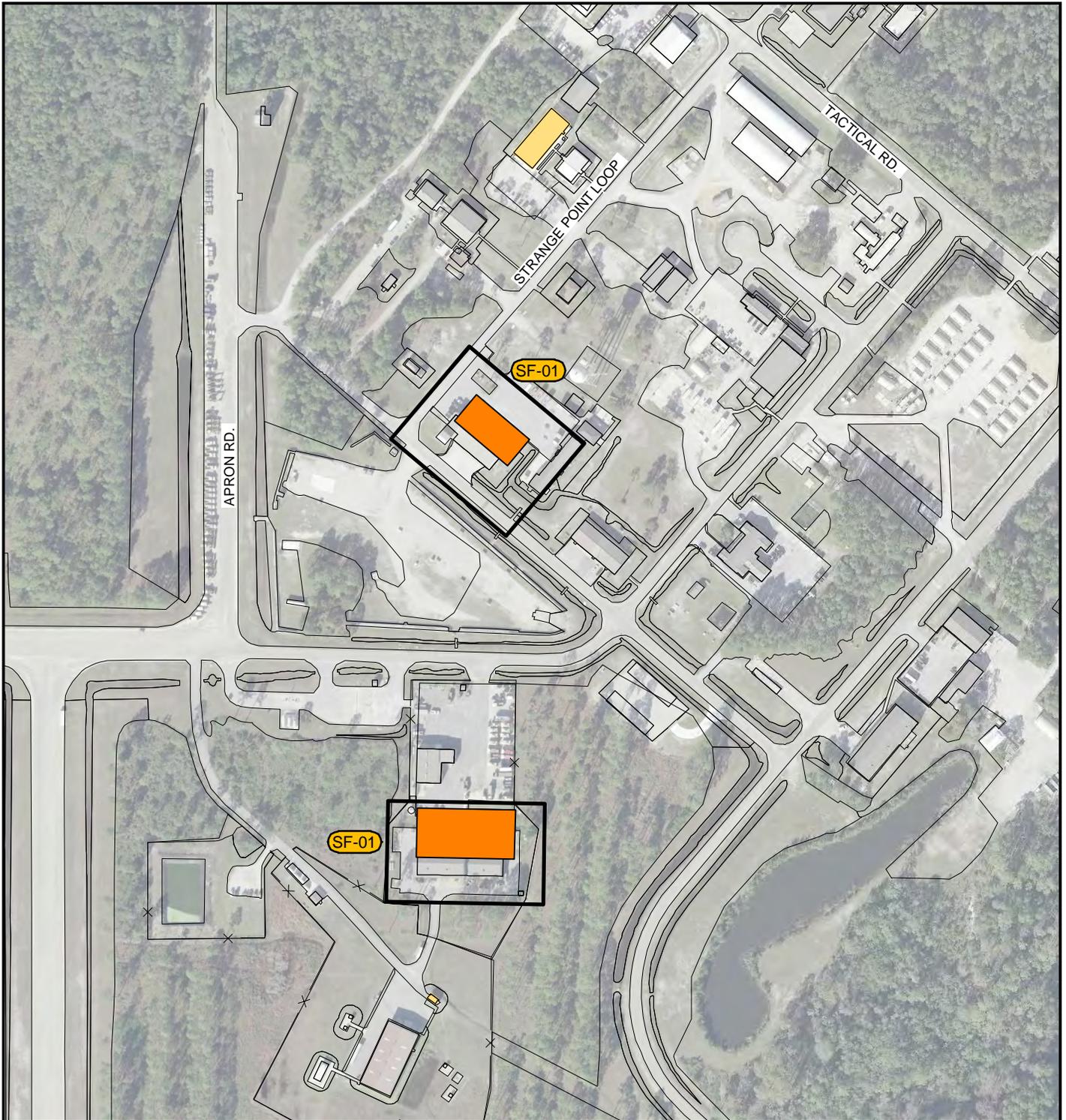
**FIGURE
 1.4-4d**

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

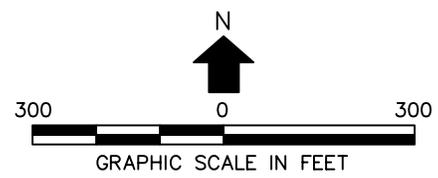
TABLE 1.4-5 SILVER FLAG AREA DEVELOPMENT

Project ID	Project Name	Description of Project	Anticipated Timeframe
SF-01	Silver Flag Facilities	Construct multiple facilities at the Silver Flag training site, including a Vehicle Maintenance Shop (11,920 SF), Base Engineer Covered Storage Facility (10,000 SF), and a Technical Training Classroom (10,072 SF). The vehicle maintenance shop provides capabilities for heavy vehicle maintenance with six maintenance bays.	Sept 2023 – Sept 2025

Source: Tyndall AFB, 2019b.



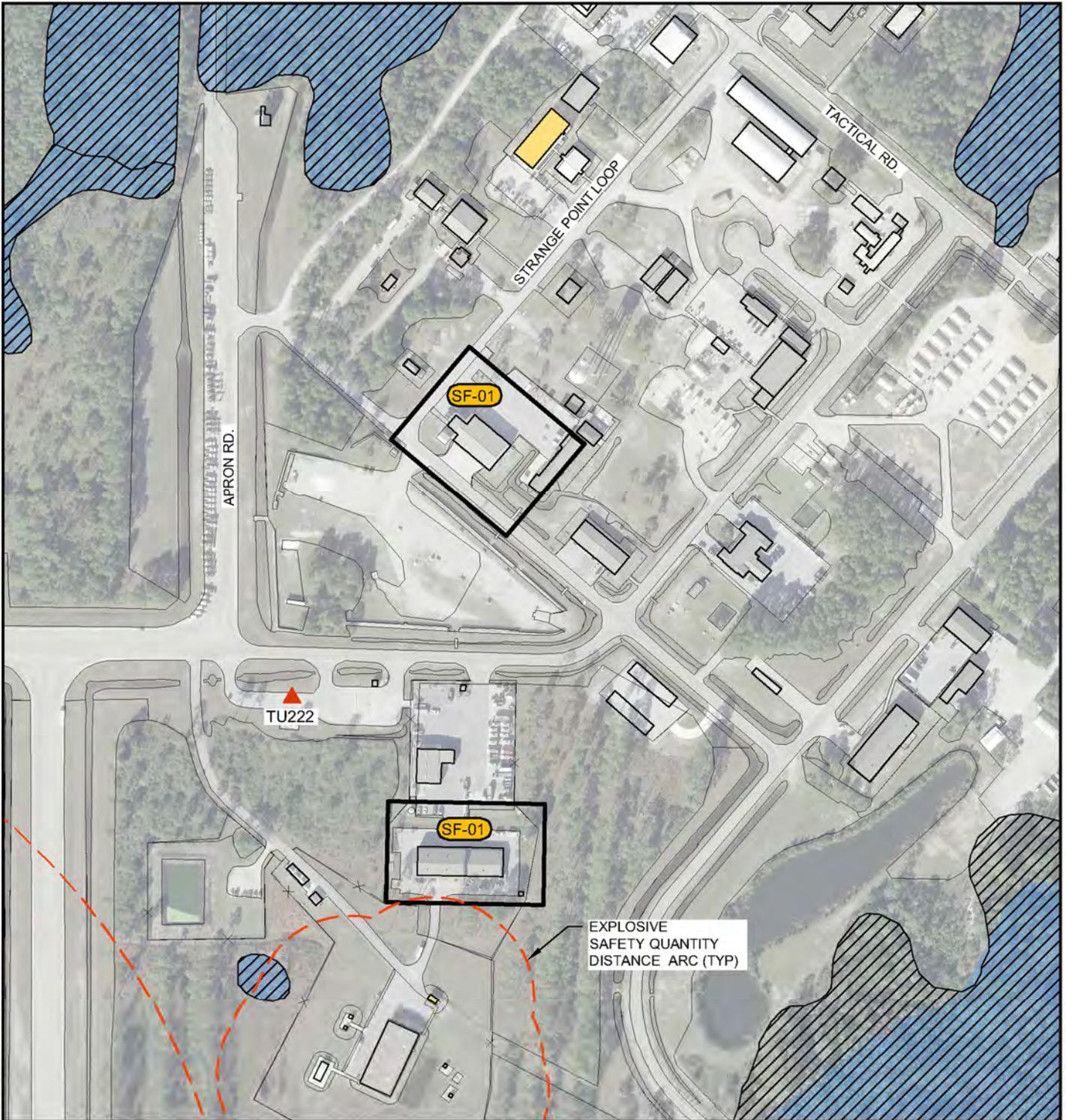
LEGEND	
	SILVER FLAG FACILITIES
	PROJECT AREA
	NEW BUILDING
	BUILDING / STRUCTURE TO BE REMOVED



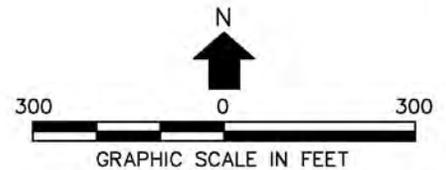
Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT

SILVER FLAG AREA PROJECTS

FIGURE
1.4-5



LEGEND			
	SILVER FLAG FACILITIES		FLOODPLAIN
	PROJECT AREA		WETLAND
	BUILDING / STRUCTURE TO BE REMOVED		CLOSED RESTORATION SITE NO FURTHER ACTION



Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

SILVER FLAG AREA CONSTRAINTS

FIGURE 1.4-5a

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 1.4-6 SUPPORT AREA DEVELOPMENT

Project ID	Project Name	Description of Project	Anticipated Timeframe
SA-01	Civil Engineer Contracting USACE Complex	<p>Construct a Civil Engineer Squadron (CES), Base Contracting Squadron, and United States Army Corps of Engineers (USACE) Complex. This project will provide administrative space for CE, Contracting, and USACE functions. Proposed facility construction includes: a Base Engineer Maintenance Shop (28,460 SF); Base Engineer Maintenance Shop 6000 Area (24,078 SF); Forestry Guard Station (6,925 SF); Base Engineer Storage Shed (37,208 SF); Base Engineer Storage Shed 6000 Area (2,063 SF); Base Engineer Administration (17,577 SF); Group HQ (7,960 SF); Administration Office, Non-Air Force (1,135 SF); Base Engineer Covered Storage Facility (20,819 SF); Base CE Storage (13,451 SF); Base CE Storage 6000 Area (10,332 SF); Helicopter Pad (2,500 SF); Explosive Ordnance Disposal (EOD) Facility (16,994 SF); and a Base Engineer Pavement & Grounds Facility (5,957 SF).</p> <p>As shown on Figure 1.4-6, the footprint of project SA-01 adjoins the footprints of projects SA-02 and SA-03. Within this combined area, approximately 219,575 SF of existing pavement would be demolished and replaced with new/realigned parking and pavement areas totaling approximately 200,946 SF.</p>	Sept 2023 – Sept 2025
SA-02	Logistics Readiness Squadron Complex	<p>Construct a Logistics Readiness Squadron (LRS) Complex to include: Vehicle Operations Administration (5,653 SF); Supply Administration (8,657 SF); Supply Administration HQ (8,451 SF); Traffic Management Office (2,393 SF); Hazardous Storage (6,095 SF); Supply Warehouse (90,375 SF); Air Freight Terminal (12,500 SF); Vehicle Yard (122,709 SF); Supply Open Storage (27,828 SF); Air Freight Processing (90,000 SF); Supply & Equipment Shed (14,930 SF); and a Vehicle Maintenance Shop (28,800 SF).</p> <p>As shown on Figure 1.4-6, the footprint of project SA-02 adjoins the footprints of projects SA-01 and SA-03. Within this combined area, approximately 219,575 SF of existing pavement would be demolished and replaced with new/realigned parking and pavement areas totaling approximately 200,946 SF.</p>	Sept 2023 – Sept 2025
SA-03	Emergency Management, EOC, ALT CP	<p>Construct an emergency management (EM) facility (11,897 SF), emergency operations center (EOC) (6,878 SF), and alternate command post (ALT CP) facility (2,269 SF) to support EM actions for base operations.</p> <p>As shown on Figure 1.4-6, the footprint of project SA-03 adjoins the footprints of projects SA-01 and SA-02. Within this combined area, approximately 219,575 SF of existing pavement would be demolished and replaced with new/realigned parking and pavement areas totaling approximately 200,946 SF.</p>	Sept 2023 – Sept 2025
SA-04	SFS Mobility Storage Facility	Construct a Mobility Storage Facility (3,000 SF) for Security Forces Squadron (SFS) to store their deployment and excess equipment.	Sept 2023 – Sept 2025
SA-05	New Lodging Facilities	Construct new Visiting Quarters (VQ) Lodging facility (169,486 SF) to provide 360 guestrooms, housekeeping spaces, and other amenities. The project will replace and consolidate the current aging and degraded visiting quarter facilities into a	July 2021 – July 2023

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

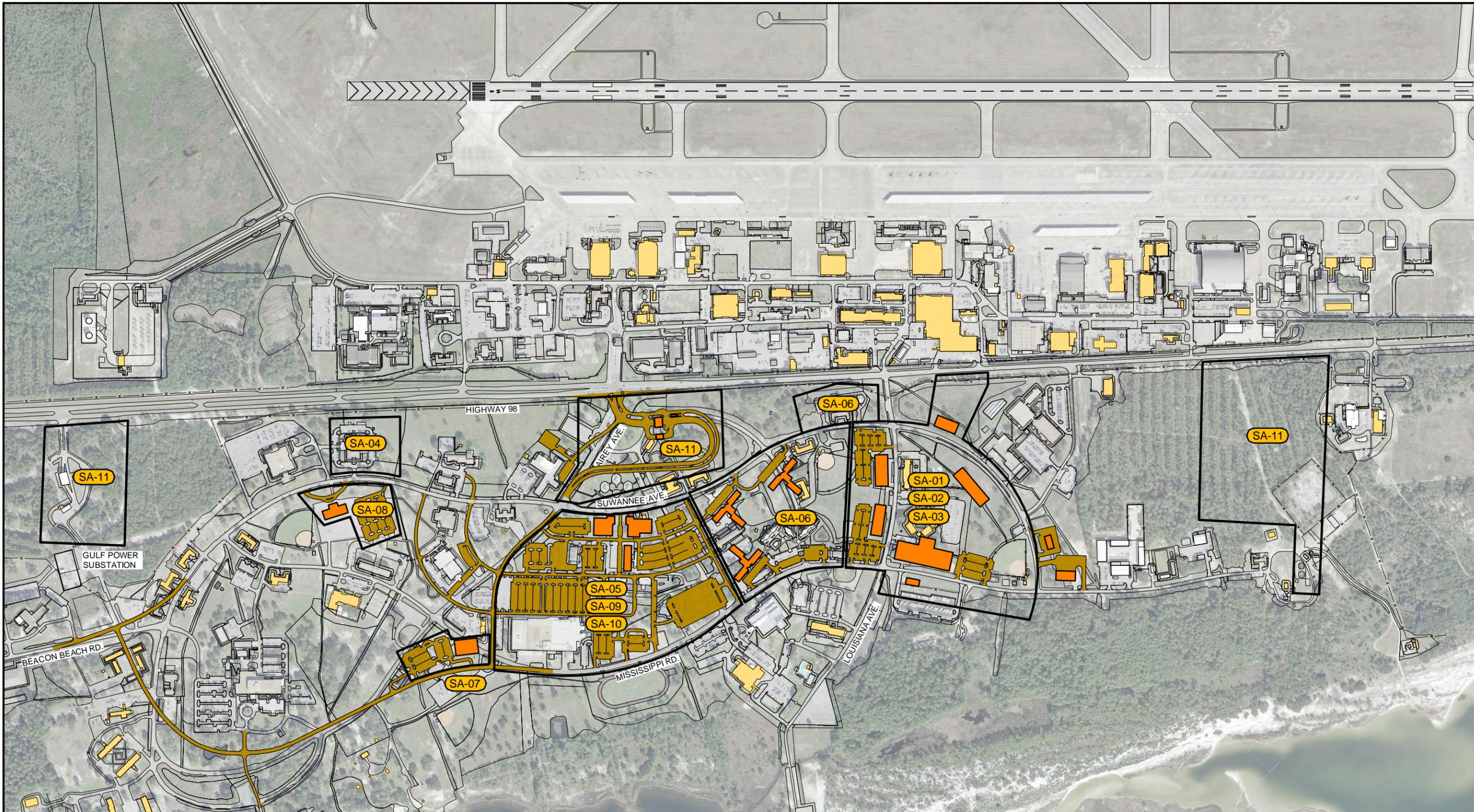
Project ID	Project Name	Description of Project	Anticipated Timeframe
		<p>new facility that meets current standards for visitors' quarters.</p> <p>As shown on Figure 1.4-6, the footprint of project SA-05 adjoins the footprints of projects SA-09 and SA-10. Within this combined area, approximately 354,012 SF of existing pavement/parking areas and approximately 130,525 SF of roadways would be demolished and replaced with new/realigned pavement/parking areas totaling approximately 686,496 SF, as well as new/realigned roadways totaling 177,299 SF.</p>	
SA-06	Dorm Complex	Construct two five-story permanent party dormitories (266,856 SF) and one one-story technical training dormitory (13,450 SF). Properly sized and configured dormitories are required to support unaccompanied permanent party E1-E4s and the training of students. A total of approximately 167,681 SF of parking area and miscellaneous pavement is proposed to be demolished, along with approximately 19,325 SF of roadway, to be replaced with approximately 106,531 SF of new impervious area.	July 2021 – July 2023
SA-07	Child Development Center	Construct large Child Development Center (41,126 SF) to support dependent children, age six week to five years, of active duty service members assigned to Tyndall AFB with full-day, part-day, and hourly child care services. A total of approximately 105,097 SF of parking area and miscellaneous pavement is proposed to be demolished, along with approximately 74,224 SF of roadway, to be replaced with approximately 78,050 SF of new parking area and 33,085 SF of new roadway.	July 2021 – July 2023
SA-08	325 FW Headquarters Building	Construct an HQ facility (26,487 SF) to accommodate the 325 FW staff. The facility would house increased growth and consolidate functions into one facility. The facility would contain Wing Operations, and Operations Support functions and would include an Intelligence Community Directive /Intelligence Community Standard compliant section. The HQ facility would also contain a separate Command Post (7,494 SF) and a Crisis Action Team. Construct a second HQs administrative facility (3,061 SF) to support sensitive military programs. A total of approximately 255,141 SF of parking area and miscellaneous pavement is proposed to be demolished, along with approximately 128,094 SF of roadway, to be replaced with approximately 83,538 SF of new parking area and 15,405 SF of new roadway.	Oct 2023 – Sept 2025
SA-09	Chapel	<p>Construct a chapel complex consisting of a Base Chapel (17,128 SF) and a religious education facility (4,873 SF). The chapel requires administrative and worship spaces.</p> <p>As shown on Figure 1.4-6, the footprint of project SA-09 adjoins the footprints of projects SA-05 and SA-10. Within this combined area, approximately 354,012 SF of existing pavement/parking areas and approximately 130,525 SF of roadways would be demolished and replaced with new/realigned pavement/parking areas totaling approximately 686,496 SF, as well as new/realigned roadways totaling 177,299 SF.</p>	Sept 2023 – Sept 2025

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project ID	Project Name	Description of Project	Anticipated Timeframe
SA-10	Community Commons Facility	<p>Construct two Community Commons facilities. The first includes a Recreation Center (8,415 SF), Bowling Center (19,624 SF), Base Restaurant (12,500 SF), and Arts and Crafts Center (9,875 SF). The second facility includes a Base Library (16,436 SF), Post Office (6,325 SF), Fast Food Service Facility and Coffee Bar (1,313 SF), and Bay County Tax Collector office (1,000 SF).</p> <p>As shown on Figure 1.4-6, the footprint of project SA-10 adjoins the footprints of projects SA-05 and SA-09. Within this combined area, approximately 354,012 SF of existing pavement/parking areas and approximately 130,525 SF of roadways would be demolished and replaced with new/realigned pavement/parking areas totaling approximately 686,496 SF, as well as new/realigned roadways totaling 177,299 SF.</p>	Sept 2023 – Sept 2025
SA-11	Tyndall AFB Gate Complexes (Support)	<p><u>Tyndall Gate (Support Area)</u>: Entry and large vehicle inspection station. Includes one Gate House (500 SF), two Lane Houses (900 SF), five lanes (three in and two out) and one Vehicle Inspection Port (3,740 SF). The vehicle inspection port is a one-bay building for authorizing and inspecting larger/heavy duty vehicles entering at the Tyndall Gate. Includes five active/passive barriers for the protection of restricted or controlled areas or any area where threat of terrorism is imminent. Supporting facilities include a canopy (4,500 SF) and overwatch facility (900 SF). The perimeter fence will span the site of the gates' primary and supporting facilities and will be 11,000 LF.</p> <p><u>Commercial Gate (Support Area)</u>: Entry and large vehicle inspection station. Includes one Gate House (500 SF), two Lane Houses (900 SF), six lanes (three in and three out) and one Vehicle Inspection Port (3,740 SF). The vehicle inspection port is a two-bay building for authorizing and inspecting larger/heavy duty vehicles entering at the Commercial Gate. Includes six active/passive for the protection of restricted or controlled areas or any area where threat of terrorism is imminent. Supporting facilities include a canopy (4,500 SF) and overwatch facility (900 SF). The perimeter fence will span the site of the gates' primary and supporting facilities and will be 11,000 LF.</p> <p>Additionally, in the gate complex areas, approximately 213,001 SF would be demolished to be replaced with approximately of 200,367 SF of roadway and 46,997 SF of miscellaneous pavement/parking area.</p>	July 2021- Nov 2021

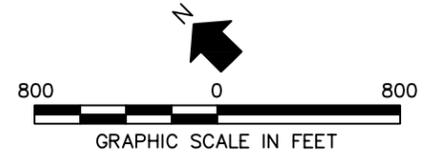
Source: Tyndall AFB, 2019b.

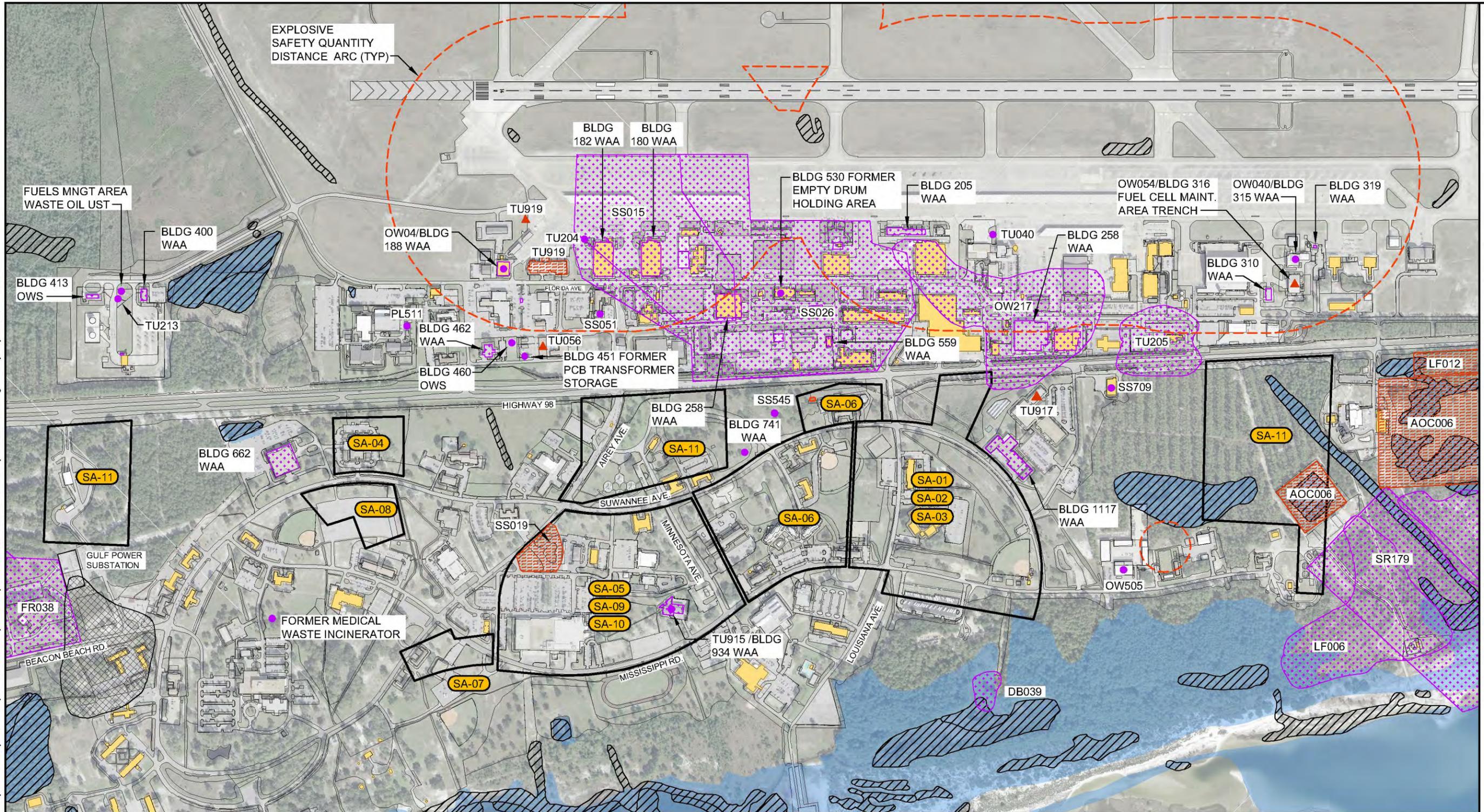
S:\Projects\G\GSR\60610846 Tyndall AFB EA 900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 1.4-6.dwg 10/10/2019 15:03



PROPOSED PROJECTS	
SA-01	CIVIL ENGINEER CONTRACTING USACE COMPLEX
SA-02	LOGISTICS READINESS SQUADRON COMPLEX
SA-03	EMERGENCY MANAGEMENT , EOC, ALT CP
SA-04	SFS MOBILITY STORAGE FACILITY
SA-05	NEW LODGING FACILITIES
SA-06	DORM COMPLEX
SA-07	CHILD DEVELOPMENT CENTER
SA-08	325 FW HEADQUARTERS BUILDING
SA-09	CHAPEL
SA-10	COMMUNITY COMMONS FACILITY
SA-11	TYNDALL AFB GATE COMPLEXES (SUPPORT)

LEGEND	
	PROJECT AREA
	NEW BUILDING
	NEW ROADS / PARKING
	BUILDING / STRUCTURE TO BE REMOVED



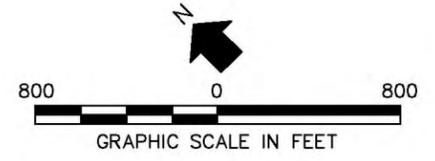


PROPOSED PROJECTS

SA-01	CIVIL ENGINEER CONTRACTING USACE COMPLEX	SA-07	CHILD DEVELOPMENT CENTER
SA-02	LOGISTICS READINESS SQUADRON COMPLEX	SA-08	325 FW HEADQUARTERS BUILDING
SA-03	EMERGENCY MANAGEMENT, EOC, ALT CP	SA-09	CHAPEL
SA-04	SFS MOBILITY STORAGE FACILITY	SA-10	COMMUNITY COMMONS FACILITY
SA-05	NEW LODGING FACILITIES	SA-11	TYNDALL AFB GATE COMPLEXES (SUPPORT)
SA-06	DORM COMPLEX		

LEGEND

	PROJECT AREA		ACTIVE RESTORATION SITE
	FLOODPLAIN		CLOSED RESTORATION SITE NO FURTHER ACTION
	WETLAND		
	GULF POWER SUBSTATION ARSENIC PLUME		



SUPPORT AREA CONSTRAINTS

FIGURE 1.4-6a

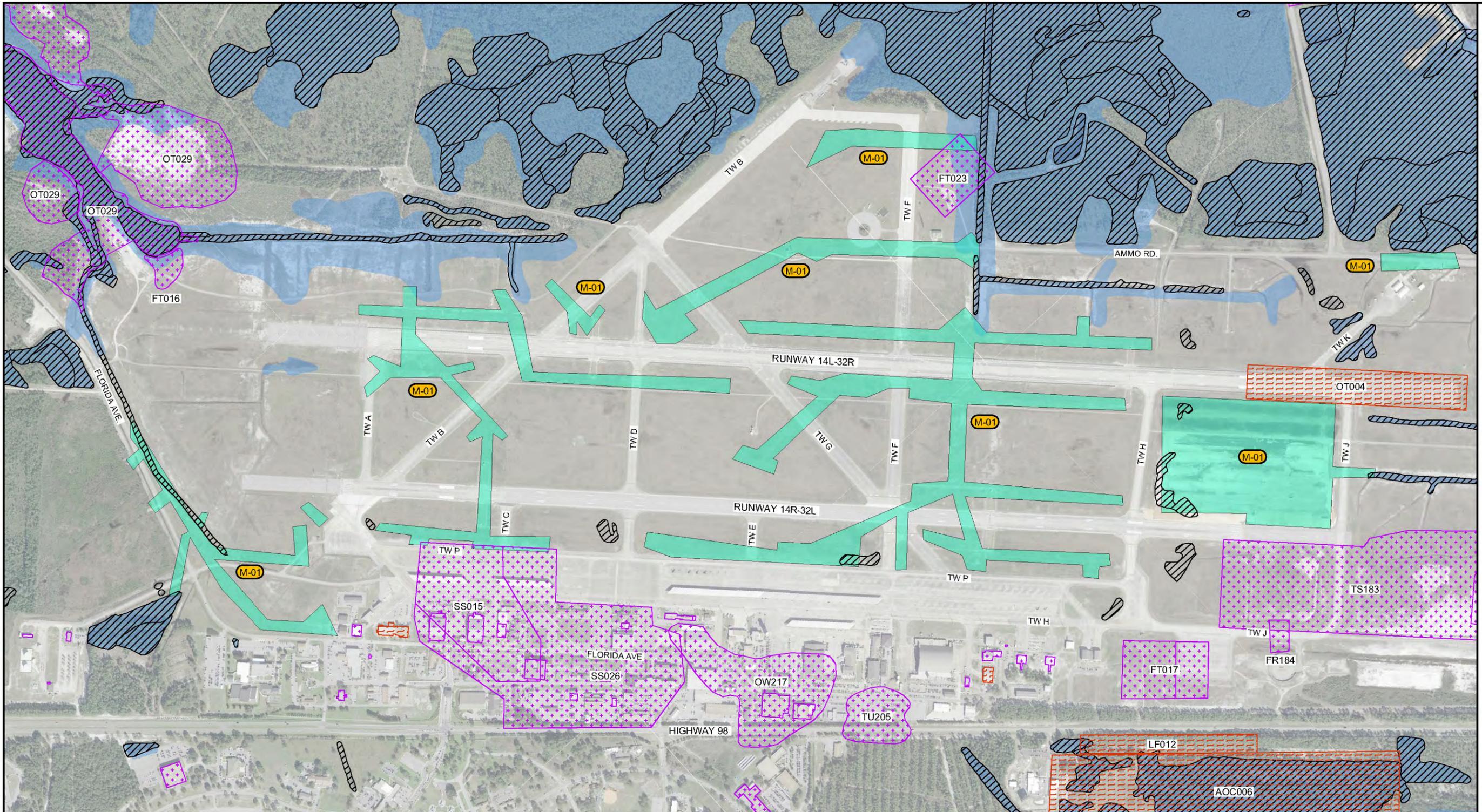
**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 1.4-7 MULTI-AREA DEVELOPMENT

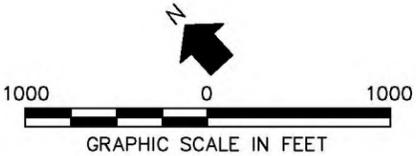
Project ID	Project Name	Description of Project	Anticipated Timeframe
M-01	Airfield Drainage	Construct drainage ditches (72,649 LF) for proper stormwater management. Standing water from inadequate drainage can severely damage airfield pavements as well as attract unwanted wildlife. This project would demolish existing pipes, inlets, retention, and all other stormwater components found inadequate or unused in the comprehensive drainage system on the airfield.	July 2021 – July 2023
M-02	Site Development and Utilities	Construct additional utilities that are required to align with the placement of the new facilities. The existing utilities are in the path of new building locations and do not meet the current standards. Utilities have reached the end of their useful life and the continued expansion of the system over the past 75 years has led to ineffective splicing, thus they need to be replaced with modern components to support further growth. Proposed utilities construction includes Electrical (120,851 LF), Water (48,510 LF), Waste Water (15,620 LF), Storm Water (22,605 LF), Communications (80,622 LF), Roads (141,357 SY), Gas Pipeline (Gas Main) (22,530 SF), and Security Fence (22,424 LF).	May 2021 – July 2022
M-03	Building Demolitions	Demolish 264 buildings/structures on Tyndall AFB, totaling 1,921,2124 SF, that have either sustained damage beyond what is economically recoverable, and/or are being replaced/consolidated by individual proposed actions. Refer to Appendix A for a listing of buildings to be demolished.	Start 2020

Source: Tyndall AFB, 2019b

This page intentionally left blank.

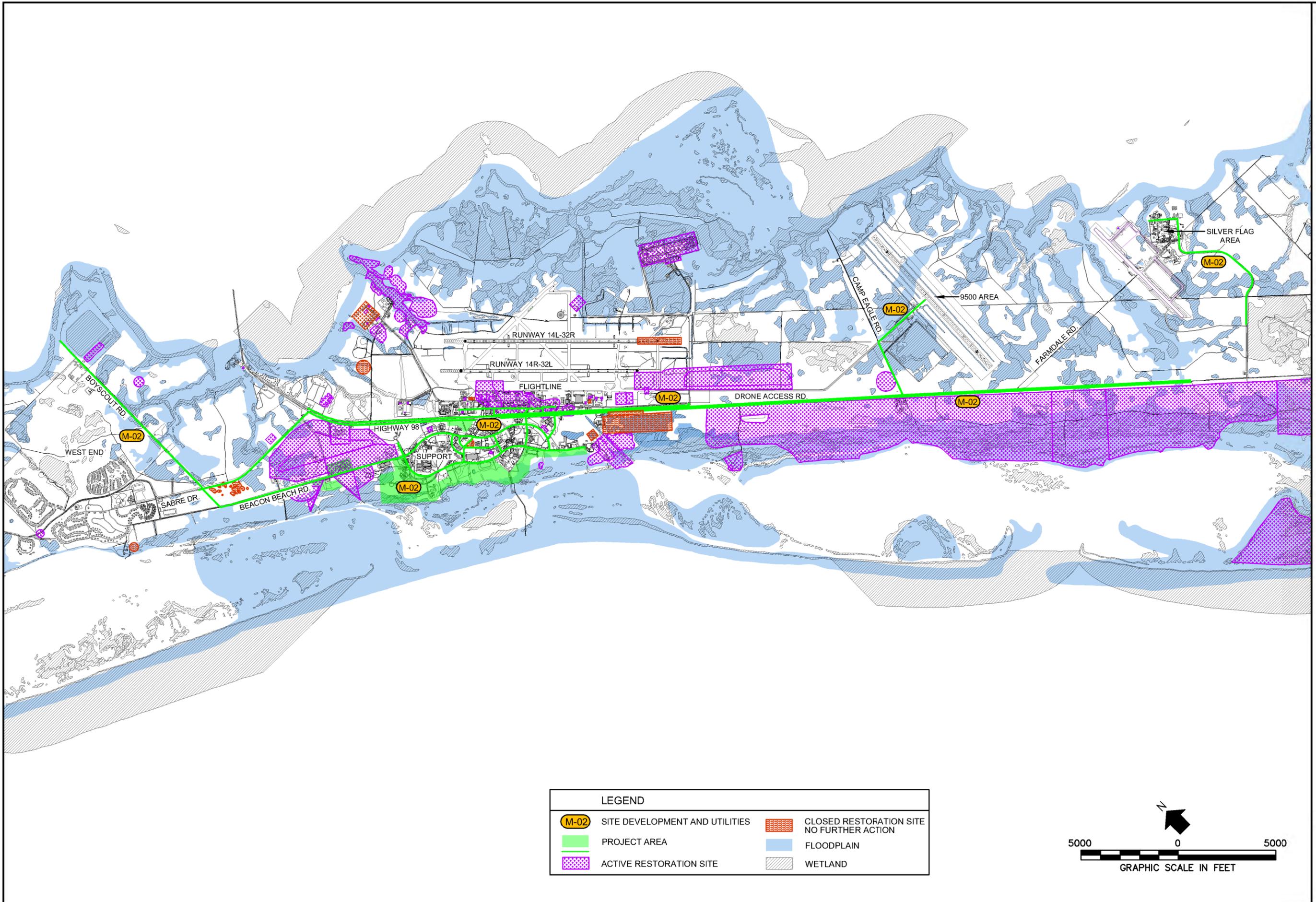


LEGEND			
	AIRFIELD DRAINAGE		WETLAND
	DRAINAGE AREAS		ACTIVE RESTORATION SITE
	FLOODPLAIN		CLOSED RESTORATION SITE NO FURTHER ACTION

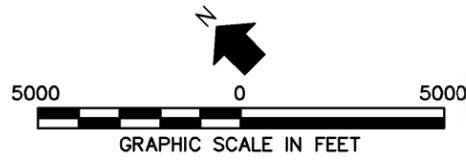


**MULTI-AREA PROJECTS AND CONSTRAINTS
 (AIRFIELD DRAINAGE)**

FIGURE
 1.4-7a



LEGEND			
	SITE DEVELOPMENT AND UTILITIES		CLOSED RESTORATION SITE NO FURTHER ACTION
	PROJECT AREA		FLOODPLAIN
	ACTIVE RESTORATION SITE		WETLAND



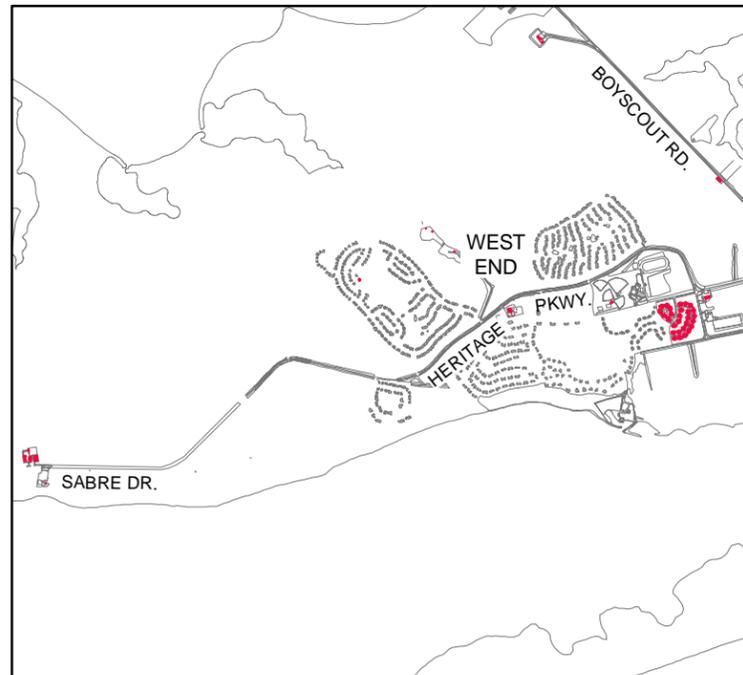
**MULTI-AREA PROJECTS AND CONSTRAINTS
 (SITE DEVELOPMENT AND UTILITIES)**

FIGURE
 1.4-7b

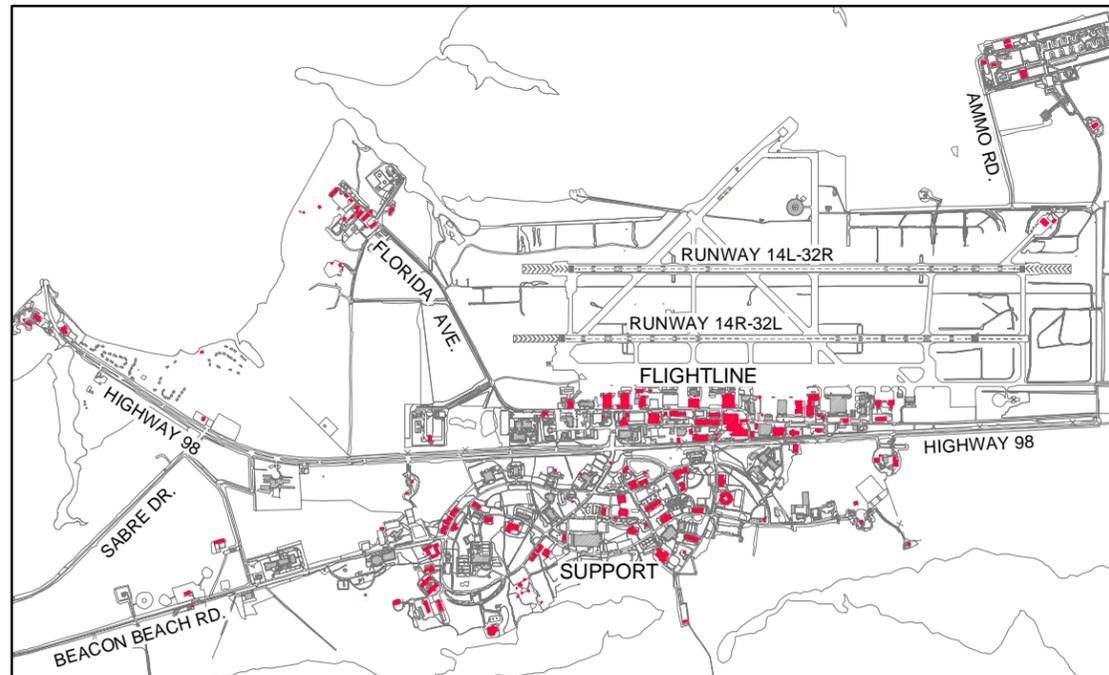
S:\Projects\G\GSR\60610846 Tyndall AFB EA 900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 1.4-7c.dwg 10/10/2019 14:18



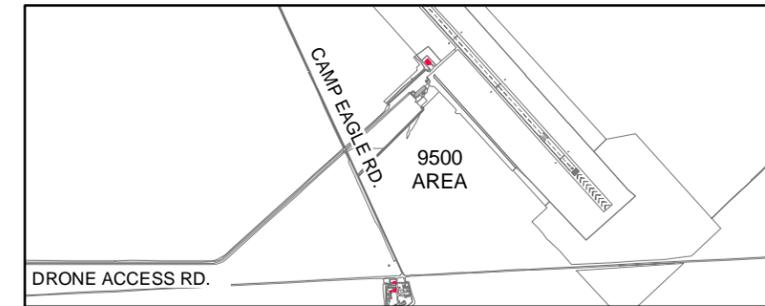
OVERALL



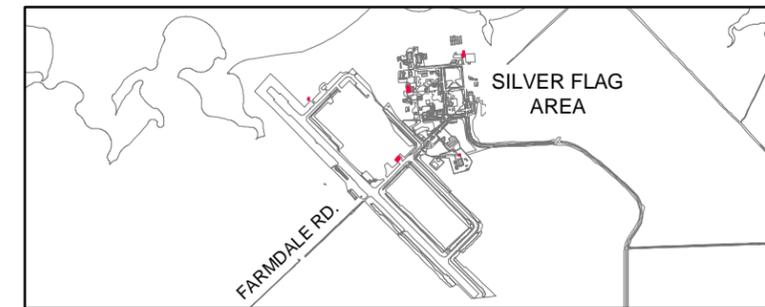
WEST END



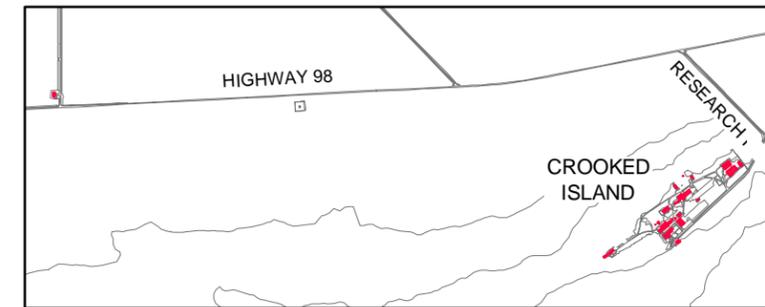
FLIGHTLINE & SUPPORT



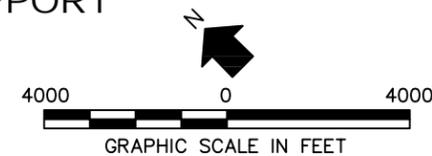
9500 AREA



SILVER FLAG AREA



CROOKED ISLAND



This Page Intentionally Left Blank

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

1.5 ENVIRONMENTAL ANALYSIS APPROACH

To effectively manage the complexity and volume of installation development projects needed on Tyndall AFB the Air Force plans to use this EA as a baseline environmental analysis for future projects that are similar in scope to those analyzed in this EA. Any additional projects or future activities proposed on areas associated with the installation must be evaluated on their own merit under the Air Force EIAP guidelines to determine their environmental impacts and appropriate level of NEPA analysis required.

1.6 INTERAGENCY/INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

1.6.1 Interagency Coordination and Consultations

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

Appendix B contains the list of agencies consulted during this analysis and copies of correspondence.

1.6.2 Government to Government Consultations

NHPA Section 106 (36 CFR 800.3) requires federal agencies to consult with Native American tribes regarding properties of cultural and religious significance. Further, EO 13175, *Consultation and Coordination with Indian Tribal Governments* directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands. Consistent with that EO, DoDI 4710.02, *Interactions with Federally-Recognized Tribes*, and AFI 90-2002, *Air Force Interaction with Federally-recognized Tribes*, federally-recognized tribes that are historically affiliated with the Tyndall AFB geographic region will be invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation or the interagency coordination processes, and it requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of other consultations. The Tyndall AFB point-of-contact for Native American tribes is the 325 FW Commander, who serves as the Installation Tribal Liaison Officer.

On 31 October 2019 the Air Force solicited early comment from the six Native American tribal governments whose interests might be directly and substantially affected by the Proposed Actions. Letters informing the tribes of the intent to prepare the attached EA and requesting input from the tribes were sent to the Poarch Band of Creek Indians, Seminole Nation of Oklahoma, Miccosukee Tribe of Indians of Florida, Muscogee (Creek) Nation, Seminole Tribe of Florida, and Thlopthlocco Tribal Town.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

These tribal governments an opportunity to review the Draft EA (see **Section 1.7.1** for details). Correspondence and additional information regarding the Native American tribal governments that were consulted with regarding these actions are listed in **Appendix B**.

1.6.3 Other Agency Consultations

As part of this EA, and per the requirements of Section 106 of the NHPA and implementing regulations (36 CFR Part 800), Section 7 of the ESA and implementing regulations, and the MBTA, findings of effect and request for concurrence were transmitted to the Florida Division of Historic Resources (FDHR) State Historic Preservation Officer (SHPO) and the U.S. Fish and Wildlife Service (USFWS) on 15 October 2019.

In the case of the SHPO, consultations on the buildings to be demolished as part of the recovery effort were initiated prior to October 2019 (**Appendix B**). Throughout this process, the SHPO concurred with the Air Force findings of no adverse effect on a majority of buildings to be demolished. As described in **Section 1.7.1**, SHPO was again consulted to review the Draft EA and responded on 13 February and 13 March of 2020 with requests for additional information, which were responded to on 26 February of 2020. As of 27 March 2020, SHPO has indicated that requested adjustments to the Draft EA and additional information provided are acceptable and they have no further concerns on the EA.

Also as of 27 March 2020, the SHPO separately issued concurrence that the Proposed Actions would present no adverse effect on buildings proposed to be demolished, with the exception of Building 703. The Air Force must fully resolve all adverse effects on this structure with the SHPO prior to undertaking any demolition action on it. Post-resolution, the Air Force would be required to integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions.

Other state and local agencies were consulted through the Florida Department of Environmental Protection (FDEP) Office of Intergovernmental Programs State Clearinghouse Process. These agencies were also provided an opportunity to review the Draft EA (see **Section 1.7.1** for details). Correspondence regarding the findings and concurrence and resolution of any adverse effect is included in **Appendix B**.

1.7 PUBLIC AND AGENCY REVIEW OF THE ENVIRONMENTAL ASSESSMENT

Because the Proposed Action areas coincide with wetlands and/or floodplains, it is subject to the requirements and objectives of EO 11990 and EO 11988. The Air Force published early notice (i.e., at least 30 days prior to the release of the Draft EA) that the Proposed Actions would occur in a floodplain/wetland in the *Panama City News Herald* in October 2019. The comment period for public and agency input on these projects lasted for 30 days. The notice identified state and Federal regulatory agencies with special expertise that had been contacted and solicited public comment on the Proposed Actions and any practicable alternatives.

A Notice of Availability (NOA) of the Draft EA was published in the *Panama City News Herald*, announcing the availability of the EA for review in January 2020. The NOA invited the public to review and comment on the Draft EA.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Copies of the Draft EA were also made available for review at the following location:

Bay County Public Library
898 W 11th St.
Panama City, FL 32401

1.7.1 Public and Agency Comments on the Draft EA

No public comments on the Draft EA were received.

Through the FDEP Clearinghouse process, environmental agency comments on the Draft EA were received from the Clearinghouse themselves on 04 March 2020, as well as from the FDEP's air, water and waste management divisions. The Florida Fish and Wildlife Conservation Commission (FWC) also commented via the Clearinghouse process. These comments were considered in preparation of the Final EA (see **Section 1.7.1**)

All tribes consulted were offered an opportunity to review the Draft EA as part of the public review process, and have also been involved in project specific consultations occurring concurrently with the EA process (**Appendix B**). The Seminole Tribe of Florida responded to the Draft EA with an affirmation that the Proposed Actions occur within the Tribe's area of interest, affirmed that there may be eligible or potentially eligible historic resources within the Proposed Action areas, and requested to be involved in continuing consultations related to undertakings at Tyndall AFB, including those described in the EA. Tyndall AFB responded on 26 February 2020 to the communication from the Seminole Tribe (**Appendix B**).

On 13 February 2020 and 13 March 2020, the SHPO responded to the EA asking for additional information on buildings to be demolished that are detailed in **Appendix A**. **Appendix A** has been updated with additional information on the buildings per SHPO request. As with the tribes, Tyndall AFB also initiated additional building-specific consultations with the SHPO on 26 February 2020 (**Appendix B**). Additionally, the FDEP Clearinghouse's 04 March 2020 letter regarding the Draft EA identifies comments from the SHPO related to inadvertent cultural resource discoveries. As of 27 March 2020, SHPO has indicated that revisions to **Appendix A** are acceptable and they have no further concerns on the EA. Also as of 27 March 2020, the SHPO separately issued concurrence that the Proposed Actions would present no adverse effect on buildings proposed to be demolished, with the exception of Building 703. As previously stated, the Air Force must fully resolve all adverse effects on this structure with the SHPO prior to undertaking any demolition action on it. Post-resolution, the Air Force would be required to integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions.

As previously referenced, the USFWS was given an opportunity to review the Draft EA, inclusive of the Biological Evaluation provided as **Appendix C** to the Draft EA. Concurrently with the Draft EA process, Tyndall AFB consulted with the USFWS specifically on Project SA-11 with respect to potential adverse effects on a population of federally threatened *Euphorbia telephioides* (telephus spurge) discovered in the vicinity (**Appendix B**). Consultations with USFWS were completed as of 25 March 2020, with USFWS issuing a Biological Opinion (BO) concurring that the Proposed Actions would not adversely affect the telephus spurge, and recommending conservation measures to avoid/relocate/enhance affected any incidentally affected populations.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

The NOA and agency/tribal comments are provided in **Appendix B**. Changes made to the Final EA in response to the agency/tribal comments described above are summarized in **Section 1.7.2** below.

1.7.2 Summary of Changes to the Draft EA

In order to provide sufficient response to agency comments received on the Draft EA, as well as to validate/fully complete wetlands evaluations ongoing for the Proposed Actions, it was necessary in some areas to incorporate reasonable changes into the Final EA. The purpose of the changes were to 1) clarify of expound upon the environmental impact analysis of the Draft EA; 2) provide additional information and analysis above and beyond what was reported in the Draft EA per comments received; and 3) identify and consider all impacts and mitigations due to the integration of any clarifications, elaborations or additions that were made.

Reasonable changes are summarized by document section on **Table 1.7-1**.

TABLE 1.7-1 SUMMARY OF CHANGES TO DRAFT EA

Document Reference	Summary of Change
Global	Updated references to literature, Air Force instructions, manuals and guidance that have been rescinded/superseded/updated either after publication of Draft EA, or concurrently with Draft EA.
Finding of No Significant Impact	Revised wetlands and other surface water quantities resulting from additional wetland delineation surveys that were conducted subsequent to the publication of the Draft EA. The estimated total numeric value of functions to fish and wildlife lost as a result of implementing the Proposed Actions was updated utilizing the Uniform Mitigation Assessment Method (UMAM). The results of the UMAM assessment were added to the FONSI. Added a summary of discrete mitigation measures required of the Proposed Actions for each environmental resource category, based on findings of the Final EA. Updated public involvement information to reflect culmination of the public and agency review processes for the Draft EA.
List of Acronyms and Abbreviations	Updated the list to reflect new acronyms and abbreviations added during preparation of the Final EA.
Section 1.6.3 - Other Agency Consultations	Updated section to reflect agency consultation that occurred concurrent with the Draft EA public comment period.
Section 1.7.1 - Public and Agency Comments on the Draft EA	Added summary of comments and input received from the public, tribes, and state and Federal agencies during the Draft EA review and comment period.
Section 1.7.2 – Summary of Changes to the Draft EA	Added section and Table 1.7-1 to identify reasonable changes to the Draft EA as a response to comments received and updated wetland survey information.
Section 1.8 - Summary of Environmental Consequences and Minimization/Mitigation Measures	Added section and Table 1.8-1 to consolidate and summarize the findings of environmental impacts expected to result from implementing the Proposed Actions, and measures that will minimize or mitigate the environmental impacts.
Section 1.9 - Decision to be Made	Changed section numbering from 1.8 to 1.9 to reflect the addition of sections to the EA prior to this section. Updated section to reflect the Air Force's decision to recommend a FONSI based on the findings of the EA and to reflect the Air Force's recommendation as part of the official NEPA action and record.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Document Reference	Summary of Change
Section 3.7.3.1 - Affected Environment (Wetlands)	Revised section to include details of additional wetland surveys that were conducted subsequent to publication of the Draft EA. Revised total acreage of wetlands and other surface waters resulting from additional wetland surveys. Updated Table 3.7-1 - Wetland and Other Surface Waters Identified in the Project Areas to reflect results of wetland surveys conducted subsequent to publication of Draft EA. Updated Figures 3.7-1a through 3.7-1h and added Figures 3.7-1i through 3.7-1p to reflect results of wetland surveys conducted subsequent to publication of Draft EA.
Section 3.10-5 Environmental Restoration Program	Updated Table 3.10-1 Installation Restoration Program (IRP) Sites Within or Adjacent to EA Proposed Actions to include additional information, most notably known site contaminants at IRP sites in response to comments from FDEP.
Section 4.1.1.2 - Demolition and Construction Activities (Environmental Consequences - Air Quality and Climate Change)	Added information regarding potential air quality permitting requirements in response to comments from FDEP.
Section 4.6.1.3 - Wetlands (Environmental Consequences - Water Resources)	Updated section with revised total acreage of wetlands and other surface waters based on additional wetland delineation surveys conducted subsequent to publication of Draft EA. Revised Table 4.6-1 Uniform Mitigation Assessment Methodology (UMAM) Analysis of Wetland Impacts Resulting from the Proposed Actions to reflect results of additional wetland surveys.
Section 4.6.1.5 - Coastal Zone Management (Environmental Consequences - Water Resources)	Updated section to reflect FDEP's 4 March 2020 finding that the Proposed Actions would have minimal impact on coastal resources and are therefore consistent with the Florida Coastal Management Program (FCMP).
Section 4.7.1 - Proposed Actions (Environmental Consequences - Biological Resources)	Added summary of comments received from the FWC and USFWS regarding suggested conservation measures for listed species.
Section 4.7.1.1 - Mitigation Measures (Environmental Consequences - Biological Resources)	Added conservation measures for listed species in response to FWC and USFWS comments.
Section 4.8.1.1 - Mitigation Measures (Environmental Consequences – Cultural Resources)	Added guidance and requirements in the event of encountering prehistoric or historic artifacts, human remains, or other potential culturally significant items, in response to comments received from FDEP. Added information on the historical evaluation status of buildings to be demolished in response to SHPO comments received. Clarified that Section 106/Section 110 consultations pursuant to the NHPA are still ongoing for a subset of individual buildings to be demolished as part of the Proposed Actions, and that a Mitigation and Monitoring Plan for the EA will include a requirement that all consultations must be fully satisfied prior to taking any action.
Section 4.9.1.1 - Hazardous Materials (Environmental Consequences - Hazardous Materials/Waste and Solid Waste)	Added requirements for spill reporting in response to FDEP comments.
Section 4.9.1.5 - Environmental Restoration Program (Environmental Consequences - Hazardous Materials/Waste and Solid Waste)	Added information in response to FDEP comments. Additions include contractor notification and communication requirements when working within IRP sites, requirement related to monitoring wells in IRP sites, potential groundwater treatment and permitting requirements for work within IRP sites, and specific information regarding a known arsenic groundwater plume near Proposed Action project SA-11.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Document Reference	Summary of Change
Section 4.11.6.1 - Proposed Actions (Cumulative Impacts - Water Resources)	Revised total acreage of wetlands and other surface waters resulting from additional wetland surveys conducted subsequent to the publication of the Draft EA. Updated section to reflect FDEP's 4 March 2020 finding that the Proposed Actions would have minimal impact on coastal resources and are therefore consistent with the FCMP.
Section 5 - Mitigation Measures and Required Permits - Biological Resources	Added a detailed summary of biological resource conservation measures in response to comments received from the FWC and USFWS.
Section 8 - References	Updated section to reflect materials and resources newly referenced in the Final EA.
Appendix A	Per SHPO comments, included additional information on buildings to be demolished regarding date of construction and evaluation status.
Appendix B	Added materials to Appendix B to reflect correspondence received during agency review of the Draft EA.
Appendix E	Added air quality modeling documentation.

1.8 SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Table 1.8-1 summarizes the potential environmental consequences from Chapter 4 of this Final EA, for each environmental resource area.

TABLE 1.8-1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Resource Area	Impact Synopsis	Minimization/Mitigation Measures
Air Quality and Climate Change (Section 4.1)	Proposed Actions would not generate any additional operational emissions compared to the No Action Alternative. Annual construction emissions would not exceed significance thresholds and would be temporary in nature.	None required.
Noise (Section 4.2)	Implementation of the Proposed Actions would not result in any aircraft noise related impacts on sensitive noise receptors in the vicinity of Tyndall AFB. Construction and demolition activities associated with the Proposed Actions are expected to result in a short-term, negligible to minor, adverse impact on the noise environment at Tyndall AFB.	None required.
Safety and Occupational Health (Section 4.3)	Short-term, minor impacts on contractor health and safety could occur from implementation of the Proposed Actions during construction and demolition activities, namely in terms of exposure to stored munitions, soil/groundwater contamination, asbestos and other demolition contaminants, and work within explosives safety setbacks. Several Proposed Actions would improve mission safety by removing damaged/unstable structures, remediating asbestos contamination and improving security.	None required.
Land Use (Section 4.4)	Each of the individual Proposed Actions is consistent with current and future land uses as determined by Tyndall AFB and documented in installation planning documents and supports the installation's long-range facility development plan. Consolidating land uses and collocating similar mission functions could produce a long-term beneficial impact from the	None required.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Resource Area	Impact Synopsis	Minimization/Mitigation Measures
	Proposed Actions.	
Soils (Section 4.5)	Site preparation and construction activities would directly disturb approximately 1,164 acres of native and non-native soils. Erosion from the construction sites could result in additional indirect effects. No prime or unique farmland soils would be disturbed or removed from the project area. There would be minor impacts on soils upon implementation of the Proposed Actions.	None required.
Water Resources (Section 4.6)	<p><i>Surface Water:</i> The Proposed Actions may potentially have temporary, negligible impacts on surface waters as a result of increases in erosion and sedimentation during periods of construction or demolition.</p> <p><i>Groundwater:</i> Proposed construction and demolition activities would not involve withdrawals from, or discharges to surface water bodies or groundwater. Groundwater within the surficial aquifer may be encountered during certain types of construction activities such as excavation within the footprint of new facilities. Negligible to minor impacts on groundwater would be expected.</p> <p><i>Wetlands:</i> It is estimated that approximately 134.9 acres of wetlands and 120,300 LF (i.e., drainage features) and 15.8 acres (stormwater pond/open water/drainage features) of other surface waters are located within the proposed project areas. Approximately 134.9 acres of wetlands were assessed using UMAM. Therefore, the approximate functional loss of wetland values as a result of construction of the Proposed Actions is 75.95 units.</p> <p><i>Floodplains:</i> A total of approximately 126.9 acres of the Proposed Action areas are located within the 100-year floodplain.</p> <p><i>Coastal Zone Management:</i> The state of Florida concurred with the determination the Proposed Actions are consistent with the Coastal Zone Management Plan (CZMP).</p>	<p>Acquire all necessary wetlands and water resource permits for the Proposed Actions, including, but not limited to National Pollutant Discharge Elimination System (NPDES) stormwater permit(s), Environmental Resource Permit(s) (ERP), CWA Section 404 Dredge and Fill Permit, Section 401 water quality certification.</p> <p>Provide mitigation, as determined by regulatory agencies during the permitting process and to be verified during final design, for approximately 134.9 acres of wetland impact, estimated in the Final EA as equivalent to 75.95 functional units of mitigation credit.</p> <p>Provide mitigation, as determined by regulatory agencies during the permitting process and to be verified during final design, for other surface waters, totaling approximately 120,300 LF of drainage features, and 15.8 acres of stormwater pond/open water/drainage features.</p> <p>Implement best management practices (BMPs) as defined in a Stormwater Pollution Prevention Plan (SWPPP) to reduce or eliminate the potential for eroded soils and contaminants from entering surface water bodies and groundwater.</p> <p>Mitigate for the loss of approximately 126.9 acres of 100-year floodplain, as determined by the Final EA and to be verified in final design, by providing compensatory storage, excavating material within or adjacent to the same floodplain to be used as fill. Compensatory storage must be provided in a manner that does not</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Resource Area	Impact Synopsis	Minimization/Mitigation Measures
		<p>disturb or impact wetlands, endangered vegetation, or potential cultural sites.</p> <p>Wherever possible as determined by final design, elevate all facilities above the base flood elevation, apply construction period erosion and sedimentation controls, and use pervious surfaces for stormwater retention and treatment.</p>
<p>Biological Resources (Section 4.7)</p>	<p>Wildlife mortality and displacement may occur during construction of the Proposed Actions. These impacts would minimally reduce the population size within the project areas, and would have a negligible effect on the overall population viability. The Air Force has determined that the Proposed Actions may affect and is likely to adversely affect the telephus spurge. The FWC has identified additional impacts to shorebirds and coastal wildlife due to project land disturbance and lighting, as well as potential interaction with Florida black bear, gopher tortoise and Florida pine snake populations, which must be considered during project implementation.</p>	<p>Prior to clearing and development, survey project areas for protected wildlife and listed species per Federal and state protocols.</p> <p>Conduct construction and demolition activities outside of shorebird breeding seasons (generally April, but potentially as early as mid-February, through August), where feasible.</p> <p>Only clear nesting sites when ready to build. Cleared areas that could become potential nesting sites will not be left for an extended amount of time. Proposed work sites will be monitored during the nesting season prior to clearing, demolition, or construction activities to ensure no active nests are present. If nesting is observed within or adjacent to a demolition or construction work site prior to or after the start of work, coordination with the FWC will be implemented to discuss nest buffers and other avoidance and minimization measures.</p> <p>Design lighting systems to avoid or reduce illumination effects on sea turtles.</p> <p>As identified by completion of Section 7 consultation with USFWS, avoid telephus spurge populations at project areas, if practicable, or salvage/relocate/enhance the affected populations .</p> <p>Suspend all work activities until encountered Florida pine snake(s) are allowed to leave with no support or hinderance.</p> <p>Adhere to Tyndall AFB Integrated</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Resource Area	Impact Synopsis	Minimization/Mitigation Measures
		<p>Natural Resources Management Plan (INRMP) measures to control nuisance interactions with Florida Black Bear populations.</p> <p>Within 30 days of ground disturbance, Tyndall AFB Natural Resources would complete a gopher tortoise survey at and in the vicinity of the construction sites. If any found burrows cannot be avoided by 25 feet, the tortoises and any commensal species would be relocated in accordance with Tyndall AFB's Threatened and Endangered Species Component Plan and FWC's current guidelines.</p>
<p>Cultural Resources (Section 4.8)</p>	<p>The Air Force finds that no adverse effect would be incurred on archaeological or historic architectural resources. Archaeological findings in the Draft EA have been approved by the SHPO and the SHPO has stated they have no further concern on the EA. Concurrence has been received that no adverse effect on historic properties would occur under the Proposed Actions, with the exception of Building 703. The SHPO also requested that the Air Force further document Building 3160 and 2894..</p>	<p>If prehistoric or historic artifacts that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, cease all activities involving subsurface disturbance in the vicinity of the discovery. Contact the Florida Division of Historical Resources (FDHR) and do not resume work without verbal and/or written authorization.</p> <p>In the event that unmarked human remains are encountered during permitted activities, stop all work immediately and notify the proper authorities within 24 hours.</p> <p>Avoid demolition of Building 703 until adverse effects are resolved with the SHPO, and post-resolution, integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions.</p> <p>Document Building 3160 and 2894 on a Historic Structure Form for submittal to SHPO.</p>
<p>Hazardous Materials/Waste and Solid Waste (Section 4.9)</p>	<p>No increases or substantial changes in current quantities and types of hazardous materials or wastes would be expected upon completion of the Proposed Actions. The Proposed Actions would result in no negligible effects regarding hazardous wastes. No or negligible effects relative to toxic substances would occur. Construction of the proposed structures and demolition of the damaged structures would generate nonhazardous, construction-related solid waste such</p>	<p>Report any spills or discharges discovered during the course of demolition and construction.</p> <p>Manage hazardous materials and disposal of hazardous substances in compliance with Tyndall AFB's Hazardous Waste Management Plan (HWMP).</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Resource Area	Impact Synopsis	Minimization/Mitigation Measures
	<p>as scrap metal and rubble. Such solid waste would be disposed at an off-base landfill or recycled/reused as appropriate and managed in accordance with the Tyndall AFB Integrated Solid Waste Management Plan (ISWMP). Therefore, minor to moderate effects relative to solid wastes at Tyndall AFB would occur due to the Proposed Actions. A variety of IRP sites are collocated with the Proposed Actions and planned construction activities have potential to cause short-term adverse impacts to ongoing remediation activities at these sites.</p>	<p>Coordinate development on ERP sites with AFCEC and address any applicable land use controls by evaluating project implementation to ensure continued protectiveness for human health and the environment.</p> <p>Ensure construction contractor compliance with 29 CFR 1910.120 to address the health and safety of its employees during construction and demolition activities, with respect to worker exposure to hazardous substances and proper management of soil and groundwater encountered during construction, including testing, handling, and disposal procedures.</p> <p>Comply with state requirements for the abandonment of any monitoring wells, injection wells, extraction wells, sparge wells, or similar treatment facilities that are found within the area of the construction and demolition activities.</p>
<p>Socioeconomic, Environmental Justice and the Protection of Children (Section 4.10)</p>	<p><i>Socioeconomics:</i> Short-term, minor, beneficial impacts on the local economy would occur from the proposed construction, demolition, and renovation projects at Tyndall AFB. No impacts on population would occur as a result of the Proposed Actions because it is expected that all construction workers would be from the local or regional area. During construction, Tyndall AFB would evaluate the need for temporary modular housing on-installation, to further defray the impact of short-term temporary needs for construction worker housing on local housing supplies.</p> <p><i>Environmental Justice:</i> Implementation of the selected projects would occur entirely on Tyndall AFB. Possible adverse effects from construction activities could include increased traffic and noise levels and decreased air quality and infrastructure capacity, but these effects would be short-term, intermittent, and minor, and would likely impact on-installation residents more than off-installation populations.</p> <p><i>Protection of Children:</i> no significant long-term change in noise or air quality is expected to result from the implementation of the Proposed Actions. Long-term beneficial impacts will also result from the implementation of the Proposed Actions, specifically the rebuild of child development</p>	<p>None required.</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Resource Area	Impact Synopsis	Minimization/Mitigation Measures
	facilities.	

Mitigation measures are also identified for any significant and unavoidable impacts. Mitigation measures avoid, minimize, remediate or compensate for environmental impact. CEQ regulations (40 CFR 1508.20) define mitigation to include the following: 1) avoiding the impact altogether by not taking a certain action or parts of an action; 2) minimizing impacts by limiting the degree or magnitude of the action, and its implementation; 3) rectifying the impact by repairing, rehabilitating or restoring the affected environment; 4) reducing or eliminating the impact over time by preservation and maintenance options during the life of the action; and/or 5) compensating for the impact by replacing or providing substitute resources or environments.

Avoiding, minimizing or reducing potential impacts has been a priority of the Air Force in guiding the development of the Proposed Actions studied in this Final EA. Mitigation measures are built or designed into the Proposed Actions (e.g., integrating design features), applied to construction activities associated with the actions (e.g., securing permits or applying BMPs), or applied as compensatory measures (e.g., purchasing mitigation credits).

Prior to the Air Force taking any action that will induce an impact, the Air Force must ensure that all required mitigations for any impact-inducing actions are in place. Following the FONSI, a Mitigation and Monitoring Plan will be prepared in accordance with 32 CFR 989.22(d). The plan will address specific mitigations identified throughout this EA and summarized on **Table 1.8-1**. The Mitigation Monitoring Plan will include actions necessary to fully satisfy special purpose environmental regulations such as the NHPA and the ESA prior to taking any action, for which project-specific consultations may continue to advance.

1.9 DECISION TO BE MADE

The Air Force typically makes one of the following three decisions regarding the Proposed Actions at the culmination of the NEPA process:

- Select the No Action Alternative and do not implement the Proposed Actions.
- Prepare a FONSI and implement the Proposed Actions, if based on the analysis in this EA, the Proposed Actions would not have a significant environmental impact.
- Initiate preparation of an EIS, if based on the analysis in this EA, the Proposed Actions would have a significant environmental impact.

For this EA, the Air Force has determined that the environmental impact analysis conducted to date supports preparation of a FONSI, provided the minimization/mitigation measures identified in **Section 1.8** of this Final EA are implemented. No EIS is required for the Proposed Actions.

This page intentionally left blank.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

Under the Proposed Action, 28 individual projects spanning six planning areas throughout the installation, as well as the three additional Multi-Area projects would rebuild Tyndall AFB to a fully operational base, providing new facilities/infrastructure, repair, demolition and functionality improvements to support the 325 FW mission and tenant units. This document assesses all individual projects within a planning area collectively as a discrete proposed action, and evaluates alternatives at a planning area level.

2.2 SELECTION STANDARDS

Under NEPA and 32 CFR Part 989, this EA is required to analyze the potential environmental impacts of the Proposed Actions, No Action Alternative, and reasonable alternatives. Reasonable alternatives are those that meet the underlying purpose of, and need for, the Proposed Actions; are feasible from a technical and economic standpoint; and meet reasonable selection standards (screening criteria) that are suitable to a particular action. Selection standards may include requirements or constraints associated with operational, technical, environmental, budgetary, and time factors. Alternatives that are determined to not be reasonable can be eliminated from detailed analysis in this EA. Additionally, EO 11988 and EO 11990 require consideration of practicable alternatives to avoid adverse effects on floodplains and wetlands, respectively. Practicable alternatives are those that are capable of being done within existing constraints and include consideration of pertinent factors including the environment, community welfare, cost, and available technology. Evaluation of multiple options in the planning process allows viable alternatives to be carried forward.

Planners review functional and spatial relationship concepts, current facility locations, environmental conditions, and the existing on-base environment. This analysis supports the NEPA process by considering several alternatives and evaluating their viability.

Alternatives to the Proposed Actions were each evaluated based on three universal selection standards, which were applied to all alternatives, described below.

Standard 1: *Planning Constraints* – Planning constraints are man-made or natural elements that can create significant limitations to the operation or construction of buildings, roadways, utility systems, airfields, training ranges, and other facilities. These constraints, when considered collectively with the installation’s capacity opportunities, inform the identification of potential areas for development, as well as those areas that can be redeveloped to support growth. This standard addresses compatibility with installation operational aspects, natural and built resources, and land use compatibility, and largely dictate the location/placement of a proposed facility.

- *Operational* – Operational constraints are generally related to flying and maintaining aircraft; storing fuel, munitions, and other potentially hazardous cargo; and operating training ranges or fulfilling similar operational requirements that can limit future development activity. At Tyndall AFB, operational constraints include, but are not limited to, airfield clearance and safety zones,

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

noise contours, explosive safety quantity distance (ESQD) zones, and antiterrorism force protection.

- *Natural* – Natural constraints include environmental and cultural resources at Tyndall AFB. These provide positive aesthetic, social, cultural, and recreational attributes that substantially contribute to the overall quality of life on base.
- *Built* – Built constraints are related to the condition, functionality, or effectiveness of infrastructure systems, facilities, and other man-made improvements.
- *Land Use Compatibility* – Land use compatibility constraints are associated with land use designations (e.g., airfield, administrative, recreation, etc.) on the installation and ensuring that planning considerations account for compatibility between proposed and existing uses (e.g., recreational use may not be compatible with the airfield).

Standard 2: *Installation Capacity Opportunities* – This refers to the capabilities of the installation’s existing facilities/infrastructure to meet existing and future mission needs. This standard largely drives the scope of the facility/infrastructure development and/or improvement and requires support of the following aspects:

- Mission operations, mission support, built infrastructure, and quality of life.

Standard 3: *Sustainability Development Indicators* – This refers to the ability to operate into the future without a decline in the mission (i.e., mission sustainment), but also minimizing impacts on the natural and man-made systems that support it (i.e., environmental sustainability). Sustainability is a holistic approach to asset management that seeks to minimize the negative impacts of the Air Force’s mission and operations on the environment. This standard also generally drives the scope of the facility/infrastructure development and/or improvement and supports sustainability of the installation through consideration of the following:

- Energy, water, waste water, air quality, facilities space optimization, encroachment, airfields, natural/cultural resources.

2.3 PROPOSED ACTIONS AND ALTERNATIVES

The NEPA and the CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Actions. Reasonable alternatives are those that also could be utilized to meet the purpose of and need for each proposed action.

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 Actions. Among the alternatives evaluated for each project is a No Action Alternative.

The scope, location, and objectives of the Proposed Actions are described here, grouped by planning area. This section also presents reasonable and practicable alternatives for projects where multiple viable courses of action exist. Those alternatives are assessed relative to the universal selection standards and

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

project-specific selection standards. Selection standards identified for this EA are aligned with the planning principles described in **Section 1.2**, and are reflective of the Air Force requirement to consider natural and operational constraints, installation capacity and resiliency, sustainability and mission sustainment matters in its decision-making process per **Section 2.2** above. Further, the selection standards acknowledge and align with directives from the Secretary of the Air Force as issued in the January 2019 Air Force Infrastructure Investment Strategy (Air Force, 2019h).

Alternatives that fully met all three universal selection standards were considered reasonable and retained for consideration in this EA. Alternatives that did not meet one or more of the standards, or only partially met the standards, were eliminated and not carried forward for detailed analysis in the EA. **Table 2.3-1** presents a summary of the project-specific and universal selection standards applicable to each installation development project (and alternative) included in this EA.

TABLE 2.3-1 PROJECT-SPECIFIC SELECTION STANDARDS SUMMARY

ID	Standard Description	Supports Universal Standards
SS- 01	Supports DoD Infrastructure Investment Strategy Objectives to: <ul style="list-style-type: none"> • Reduce total facility square footage of obsolete or unused facilities by five percent in 20 years through divestment, demolition, conversion and consolidation. • Cost-effectively modernize infrastructure by driving down life-cycle costs of recapitalization and improve infrastructure readiness. • Harden infrastructure, reduce vulnerabilities, and respond/recover from disruptions to operations and supporting infrastructure. • Prioritize repair of mission-critical infrastructure to achieve a facility mission capable rate of 90 percent or higher. 	Standard 1 (Built Constraints); Standard 2 (Mission Operations and Built Infrastructure); Standard 3 (Facilities Space Optimization)
SS-02	Complies with mission needs by: <ul style="list-style-type: none"> • Promoting operational efficiency and mission adjacency. • Complying with all facility sizing and siting requirements based on mission needs. • Prioritizing consolidation and relocation efforts to create development opportunities and improve operational efficiencies. 	Standard 2 (Mission Operations and Support, and Built Infrastructure)
SS-03	Supports MWR programs in accordance with AFI 34-101.	Standard 2 (Mission Support and Quality of Life)
SS-04	Avoids or minimizes interaction with operational and natural resource constraints (wetlands, floodplains, cultural resources, known contamination sites, clear zones, accident potential zones, explosives safety setbacks); or unavoidable interactions can be adequately mitigated.	Standard 1 (Operational and Natural Constraints)

2.3.1 Flightline Area Alternatives

Besides the Flightline Area proposed action alternative shown on **Figure 1.4-4**, the Air Force investigated the following alternative courses of action to many of the individual Flightline Area projects defined in **Section 1.4** of this EA (AECOM, 2019). Adjacent planning constraints (i.e., natural resources, institutional controls boundaries) were considered where present. Each alternative is assessed in further

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

detail in the following sections, including an assessment of whether or not it conforms to applicable universal and project-specific selection standards, summarized on **Table 2.3-2**.

Alternatives Considered:

- ***Proposed Action Alternative (Figures 1.4-4a and 1.4.4c):*** The proposed action alternative is considered the Air Force Preferred Alternative for Flightline Area reconstruction, including restoration of damaged MSA facilities (detailed in **Section 1.4**). The proposed action alternative would require airfield criteria waivers for penetrations to imaginary surfaces designed to provide adequate vertical clearance for arriving and departing aircraft. It also promotes operational adjacency and allows live ordnance loading adjacent to the Flightline.
- ***Alternative A (Figure 2.3-1):*** Alternative A focuses on the re-utilization of existing buildings, pavements and utilities wherever possible (MSA facility reconstruction for this alternative is the same as the proposed action alternative) Requires airfield criteria waivers to provide adequate vertical clearance for arriving and departing aircraft. Limits live ordnance loading of aircraft to the Live Ordnance Loading Area north of the Flightline ramp and runways. Some facility configurations do not promote operational adjacency. For clarity and for presentation purposes, pertinent Flightline Area constraints are shown separately on **Figure 2.3-1a**.
- ***Alternative B (Figure 2.3-2):*** Alternative B is similar to Alternative A but installs a larger degree of new structures and infrastructure (MSA facility reconstruction for this alternative is the same as the proposed action alternative). Allows live ordnance loading adjacent to the Flightline. Sets buildings back further toward U.S. Highway 98 which alleviates the need for airfield criteria waivers, but as a consequence reduced support facility area between the Flightline and U.S. Highway 98. For clarity and for presentation purposes, pertinent Flightline Area constraints are shown separately on **Figure 2.3-2a**.
- ***No Action Alternative:*** The No Action Alternative, Flightline operational capabilities and structural/infrastructural requirements would not be restored.

Selection Standards Evaluation:

The results of the selection standards evaluation of the Proposed Action and alternatives is summarized on **Table 2.3-2** below. As shown, Alternative A does not satisfy SS-01 or SS-02. Alternative B satisfies SS-01 but only partially satisfies SS-02 and SS-04 and would result in operational inefficiencies as well as reduced safety due to proximity of explosives and munitions safety setbacks to public traffic route U.S. Highway 98. Therefore, Alternatives A and B were not retained for further evaluation.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 2.3-2 SELECTION STANDARDS EVALUATION: FLIGHTLINE AREA ALTERNATIVES

ID	Evaluation		
	Proposed Action Alternative (Figures 1.4-4a and 4c)	Alternative A (Figure 2.3-1)	Alternative B (Figure 2.3-2)
SS-01	<u>Yes</u> : Consolidates building areas/functions, promotes new, efficient buildings, and minimizes additional pavement areas.	<u>No</u> : Maximizes use of existing buildings, pavements, utilities, which does not increase resiliency, efficiency, or drive down life-cycle costs.	<u>Yes</u> : Consolidates building areas/functions, promotes new, efficient buildings, and minimizes additional pavement areas.
SS-02	<u>Yes</u> : Allows ordnance loading on Flightline. Facility consolidation promotes adjacency which lowers mission response times and increases operational efficiency.	<u>No</u> : Operationally inefficient since facilities are spread out and maintenance access time is increased. Does not allow loading of ordnance on Flightline.	<u>Yes/Partially</u> : Although some facility consolidation occurs which maximizes efficiency and adjacency, limits support space between Flightline and U.S. Highway 98, limiting development opportunities in these areas.
SS-03	Not applicable		
SS-04	<u>Yes</u> : Vertical penetrations to airspace occur but can be mitigated using airfield criteria waiver process. ERP sites coincide with project areas but interaction can be mitigated using design measures and obeying institutional controls/best practices during construction.	<u>Yes</u> : Vertical penetrations to airspace surfaces occur but can be mitigated using airfield criteria waiver process. ERP sites coincide with project areas, but interaction can be mitigated using design measures and obeying institutional controls/best practices during construction.	<u>Yes/Partially</u> : Airfield criteria waivers for vertical airspace penetrations are not needed due to greater structure distances from airfield. ERP site involvement can be mitigated as with other alternatives. However, places explosives/munitions safety setbacks closer to public traffic route U.S. Highway 98 than other alternatives.

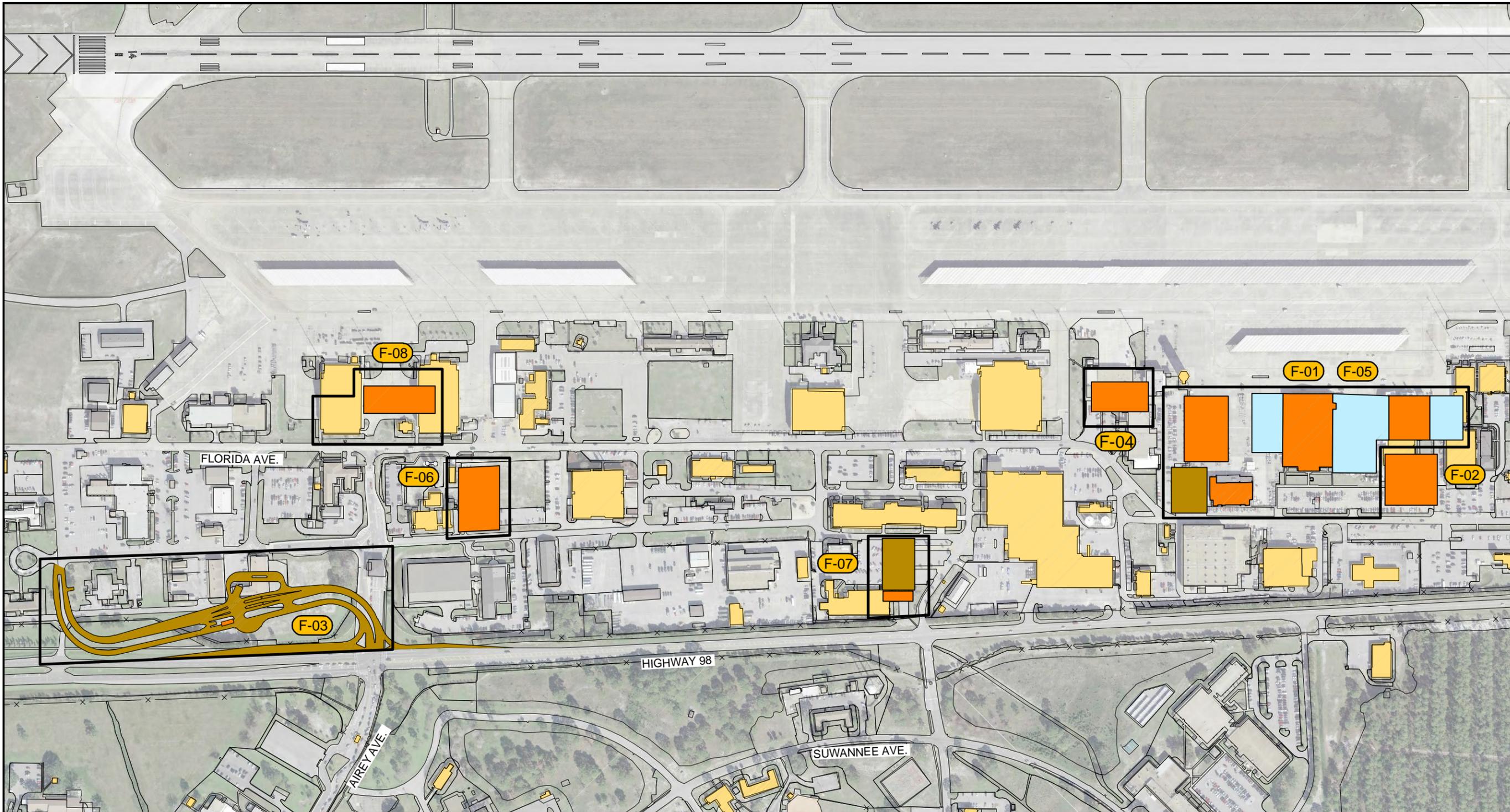
Selection Standards Legend:

- SS-01: Supports DoD Infrastructure Investment Strategy objectives
- SS-02: Complies with mission needs
- SS-03: Supports MWR programs
- SS-04: Avoids/minimizes operational and environmental constraints

Color Legend:

- Green** – Alternative meets selection standard. (or “mostly meets”)
- Yellow** – Alternative partially meets selection standard. (or “meets some but not most”)
- Red** – Alternative does not meet selection standard. (or “does not meet most”)

This page intentionally left blank.

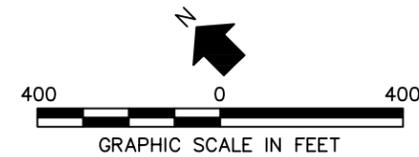


PROPOSED PROJECTS

- F-01** 53 WEG HANGAR
- F-02** 53 WEG HQ FACILITY
- F-03** TYNDALL AFB GATE COMPLEXES (FLIGHTLINE)
- F-04** OSS FACILITY
- F-05** WEG PARKING APRON
- F-06** AEROSPACE AND OPERATIONAL PHYSIOLOGY FACILITY
- F-07** SPECIAL PURPOSE VEHICLE MAINTENANCE
- F-08** OPERATIONS GROUP / MAINTENANCE GROUP HQ

LEGEND

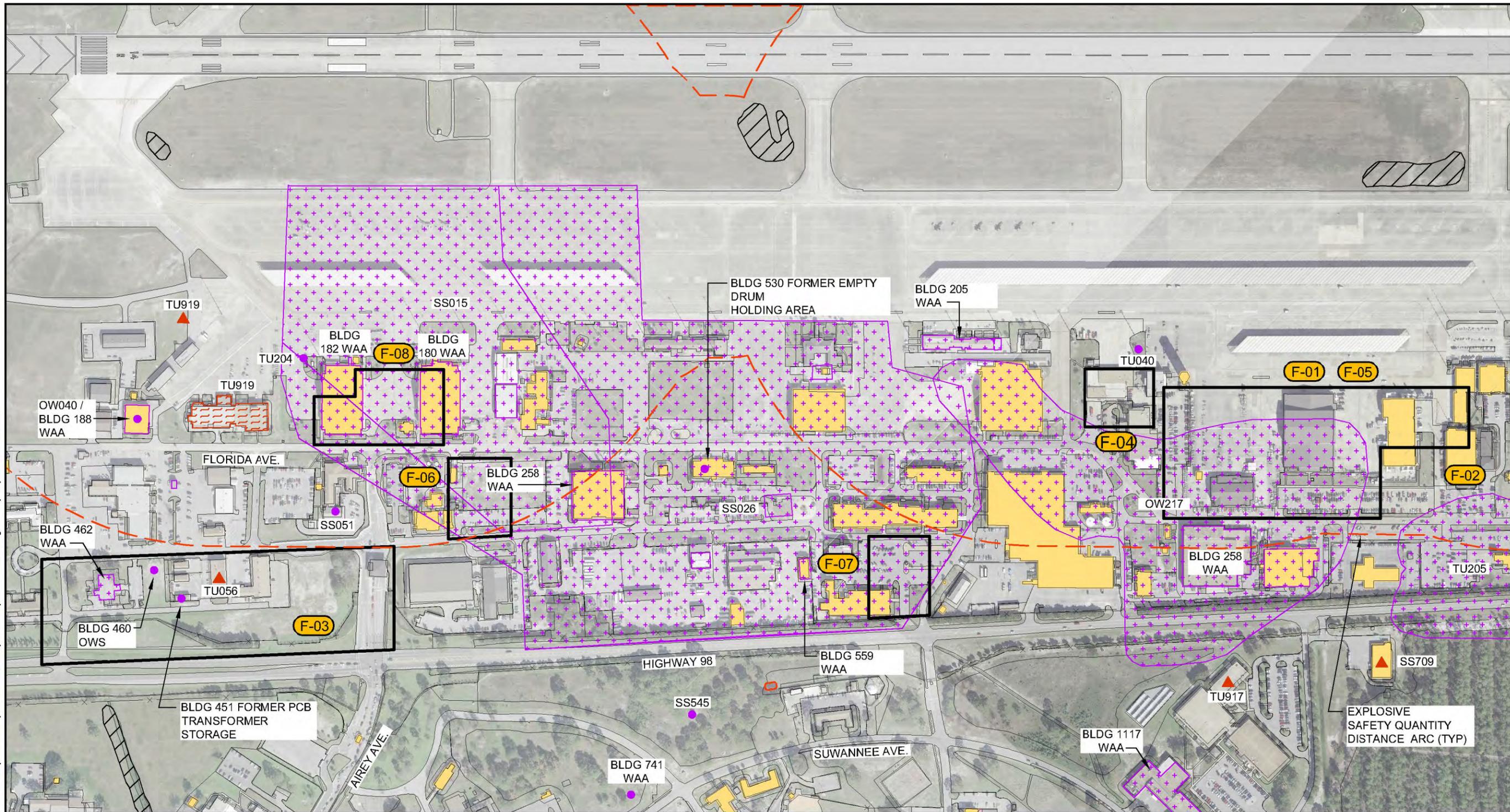
- PROJECT AREA
- NEW BUILDING
- NEW ROADS / PARKING / APRON
- NEW AIRCRAFT PARKING APRON
- BUILDING / STRUCTURE TO BE REMOVED



**FLIGHTLINE AREA PROJECTS
 (ALTERNATIVE A)**

**FIGURE
 2.3-1**

S:\Projects\G\GSR\60610846 Tyndall AFB EA\900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 2.3-1a.dwg 10/18/2019 13:37

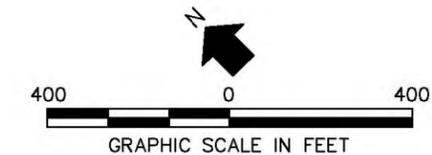


PROPOSED PROJECTS

- F-01** 53 WEG HANGAR
- F-02** 53 WEG HQ FACILITY
- F-03** TYNDALL AFB GATE COMPLEXES (FLIGHTLINE)
- F-04** OSS FACILITY
- F-05** WEG PARKING APRON
- F-06** AEROSPACE AND OPERATIONAL PHYSIOLOGY FACILITY
- F-07** SPECIAL PURPOSE VEHICLE MAINTENANCE
- F-08** OPERATIONS GROUP / MAINTENANCE GROUP HQ

LEGEND

- PROJECT AREA
- BUILDING / STRUCTURE TO BE REMOVED
- WETLAND
- ACTIVE RESTORATION SITE
- CLOSED RESTORATION SITE NO FURTHER ACTION

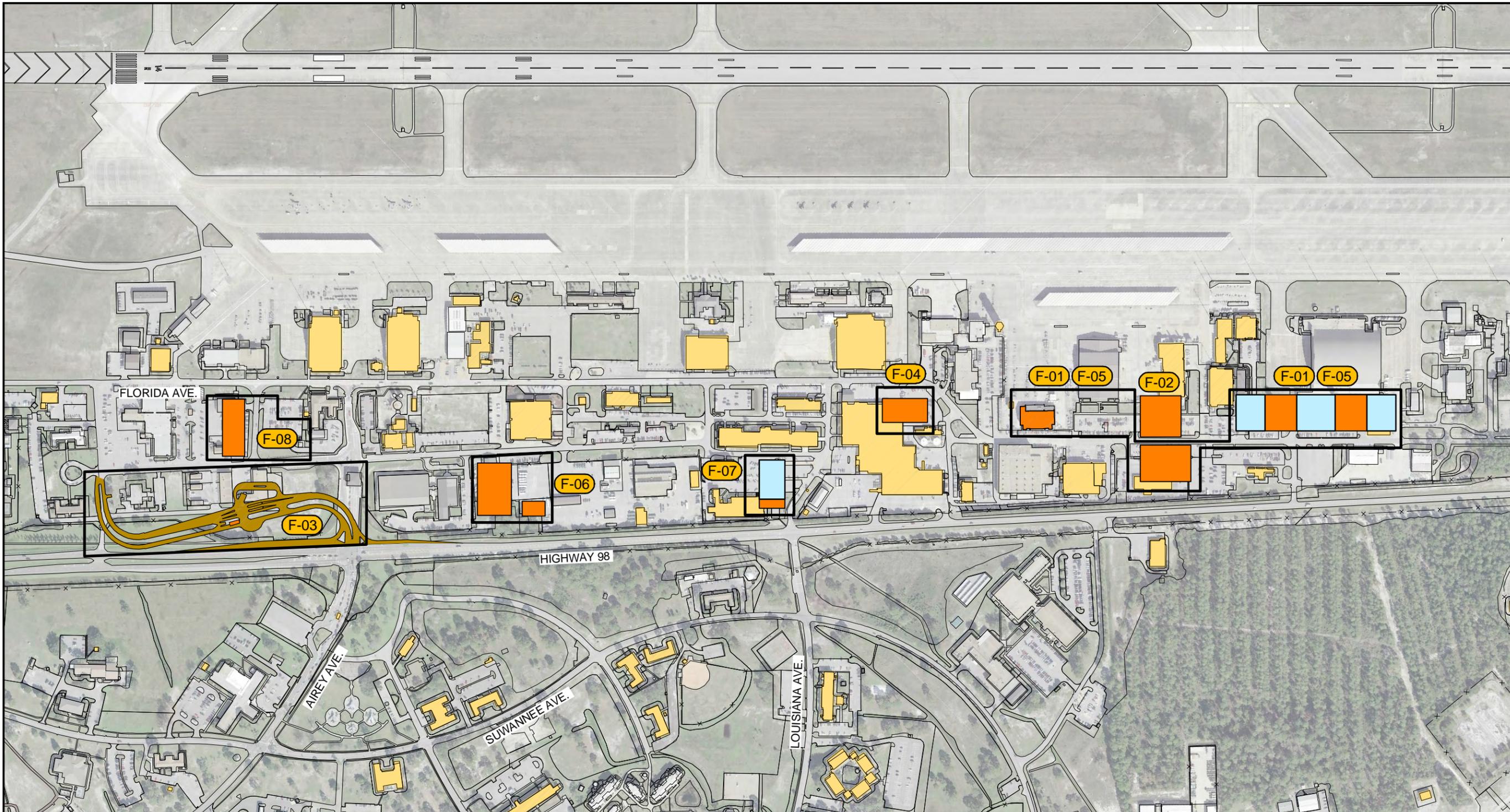


**FLIGHTLINE AREA CONSTRAINTS
(ALTERNATIVE A)**

Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



FIGURE 2.3-1a

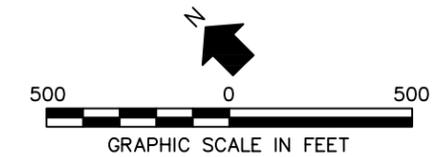


PROPOSED PROJECTS

- F-01** 53 WEG HANGAR
- F-02** 53 WEG HQ FACILITY
- F-03** TYNDALL AFB GATE COMPLEXES (FLIGHTLINE)
- F-04** OSS FACILITY
- F-05** WEG PARKING APRON
- F-06** AEROSPACE AND OPERATIONAL PHYSIOLOGY FACILITY
- F-07** SPECIAL PURPOSE VEHICLE MAINTENANCE
- F-08** OPERATIONS GROUP / MAINTENANCE GROUP HQ

LEGEND

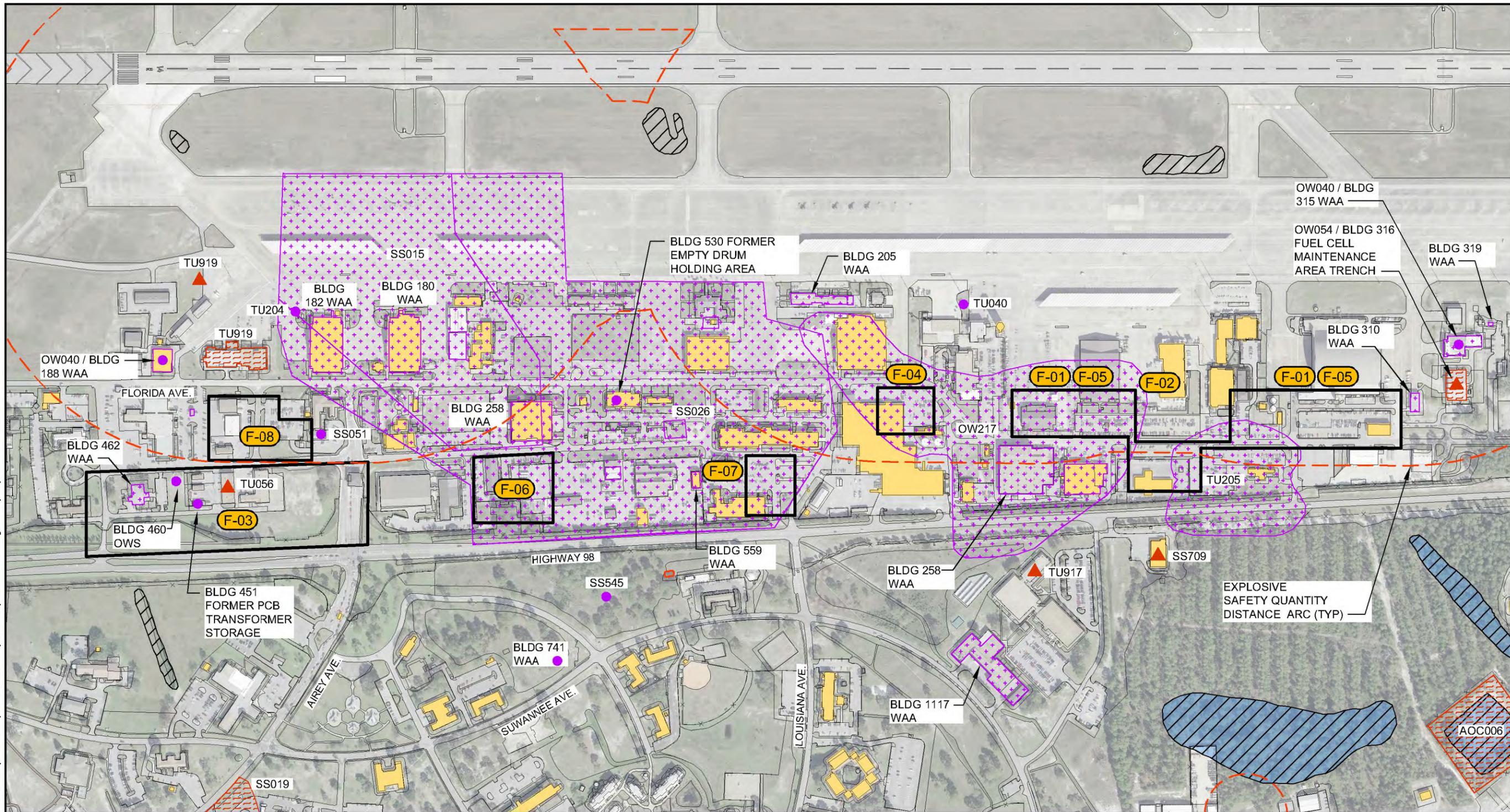
- PROJECT AREA
- NEW BUILDING
- NEW ROADS
- NEW AIRCRAFT PARKING APRON
- BUILDING / STRUCTURE TO BE REMOVED



**FLIGHTLINE AREA PROJECTS
(ALTERNATIVE B)**

**FIGURE
2.3-2**

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 2.3-2a.dwg 10/18/2019 13:38

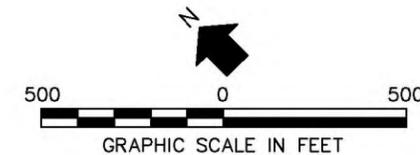


PROPOSED PROJECTS

- F-01** 53 WEG HANGAR
- F-02** 53 WEG HQ FACILITY
- F-03** TYNDALL AFB GATE COMPLEXES (FLIGHTLINE)
- F-04** OSS FACILITY
- F-05** WEG PARKING APRON
- F-06** AEROSPACE AND OPERATIONAL PHYSIOLOGY FACILITY
- F-07** SPECIAL PURPOSE VEHICLE MAINTENANCE
- F-08** OPERATIONS GROUP / MAINTENANCE GROUP HQ

LEGEND

- PROJECT AREA
- BUILDING / STRUCTURE TO BE REMOVED
- FLOODPLAIN
- ACTIVE RESTORATION SITE
- CLOSED RESTORATION SITE NO FURTHER ACTION
- WETLAND



**FLIGHTLINE AREA CONSTRAINTS
(ALTERNATIVE B)**

Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



FIGURE 2.3-2a

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

2.3.2 SUPPORT AREA ALTERNATIVES

Besides the Support Area proposed action alternative shown on **Figure 1.4-6**, the Air Force investigated the following alternative courses of action to many of the individual Support Area projects defined in **Section 1.4** of this EA (AECOM, 2019). Adjacent planning constraints (i.e., natural resources, institutional controls boundaries) were considered where present. Each alternative is assessed in further detail in the following sections, including an assessment of whether or not it conforms to applicable universal and project-specific selection standards, summarized on **Table 2.3-3**.

Alternatives Considered:

- ***Proposed Action Alternative (Figure 1.4-6):*** The proposed action alternative is considered the Air Force Preferred Alternative for Support Area reconstruction (detailed in **Section 1.4**). The proposed action alternative maximizes consolidation of existing functions, optimizes land use development patterns, and integrates a variety of transportation improvements to streamline vehicular and pedestrian circulation.
- ***Alternative A (Figure 2.3-3):*** Focuses on utilizing existing transportation network, infrastructure and facilities to maximum extent practicable. Duplicates pre-storm development patterns. Pertinent Support Area constraints are also shown on **Figure 2.3-3**.
- ***Alternative B (Figure 2.3-4):*** Similar to Alternative A but prioritizes demolition and replacement of existing facilities. Consolidates existing functions into new multi-story buildings. Pertinent Support Area constraints are also shown on **Figure 2.3-4**.
- ***No Action Alternative:*** The No Action Alternative, Support Area facilities and functions would remain unsupported and degraded from post-hurricane conditions.

Selection Standards Evaluation:

The results of the selection standards evaluation of the Proposed Action and alternatives is summarized on **Table 2.3-3** below. As shown, Alternative A does not satisfy SS-01 and only partially satisfies SS-02. Alternative B satisfies SS-01, SS-03, SS-04, and SS-05, but only partially satisfies SS-02 and would not improve pedestrian and vehicular circulation or optimize development patterns within the Support Area. Therefore, Alternatives A and B were not retained for further evaluation.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 2.3-3 SELECTION STANDARDS EVALUATION: SUPPORT AREA ALTERNATIVES

ID	Evaluation		
	Proposed Action Alternative (Figure 1.4-6)	Alternative A (Figure 2.3-3)	Alternative B (Figure 2.3-4)
SS-01	<u>Yes:</u> Consolidates existing functions into new multi-story facilities with lower life cycle costs, increased resiliency and greater optimization of available facility space.	<u>No:</u> Reuses existing infrastructure and does not fully consolidate facilities in a way that reduces facility and infrastructure footprints. Maintenance and life-cycle costs are not reduced due to a lack of consolidation.	<u>Yes:</u> Consolidates existing functions into new multi-story facilities with lower life cycle costs, increased resiliency and greater optimization of available facility space.
SS-02	<u>Yes:</u> Consolidates all 325 LRS and 325 CES facilities into the Support Area, which frees up developable space in the Flightline Area and reduces travel time between 325 LRS facilities. Simplifies roadway alignments and pedestrian walkways in order to improve pedestrian/vehicular circulation and optimize development patterns in the area.	<u>No:</u> Does not fully relocate 325 LRS and 325 CES functions from Flightline Area which does not fully support adjacency and efficiency objectives, increases travel times, and foregoes some Flightline development opportunities. Does not improve pedestrian/vehicular circulation or optimize development patterns in the area.	<u>Yes/Partially:</u> Consolidates all 325 LRS and 325 CES facilities into the Support Area, which frees up developable space in the Flightline Area and reduces travel time between 325 LRS facilities. Does not improve pedestrian/vehicular circulation or optimize development patterns in the planning area.
SS-03	<u>Yes:</u> Provides full consolidation and enhancement of MWR facilities.	<u>Yes/Partially:</u> Restores facilities that are contributive to installation MWR needs but does not fully consolidate these facilities or improve quality of life beyond “status quo” conditions.	<u>Yes:</u> Provides full consolidation and enhancement of MWR facilities.
SS-04	<u>Yes:</u> Avoids all applicable major natural and operational constraints located within Support Area.	<u>Yes:</u> Some projects are sited within or adjacent to 100-year floodplain, but opportunities exist to avoid or minimize encroachment.	<u>Yes:</u> Some projects are sited within or adjacent to 100-year floodplain, but opportunities exist to avoid or minimize encroachment.

Selection Standards Legend:

SS-01: Supports DoD Infrastructure Investment Strategy objectives

SS-02: Complies with mission needs

SS-03: Supports MWR programs

SS-04: Avoids/minimizes operational and environmental constraints

Color Legend:

Green – Alternative meets selection standard. (or “mostly meets”)

Yellow – Alternative partially meets selection standard. (or “meets some but not most”)

Red – Alternative does not meet selection standard. (or “does not meet most”)

S:\Projects\G\GSR\60610846 Tyndall AFB EA\900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 2.3-3.dwg 10/18/2019 13:41

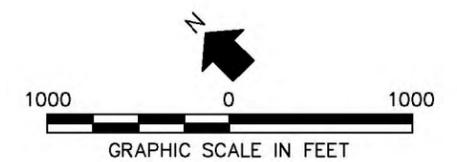


PROPOSED PROJECTS

- | | |
|-------------------------------------------------------|-------------------------------------------|
| SA-01 CIVIL ENGINEER CONTRACTING USACE COMPLEX | SA-07 CHILD DEVELOPMENT CENTER |
| SA-02 LOGISTICS READINESS SQUADRON COMPLEX | SA-08 325 FW HEADQUARTERS BUILDING |
| SA-03 EMERGENCY MANAGEMENT , EOC, ALT CP | SA-09 CHAPEL |
| SA-05 NEW LODGING FACILITIES | SA-10 COMMUNITY COMMONS FACILITY |
| SA-06 DORM COMPLEX | |

LEGEND

- BUILDING / STRUCTURE TO BE REMOVED
- FLOODPLAIN
- WETLAND
- ACTIVE RESTORATION SITE
- CLOSED RESTORATION SITE
NO FURTHER ACTION



**SUPPORT AREA PROJECTS AND CONSTRAINTS
(ALTERNATIVE A)**

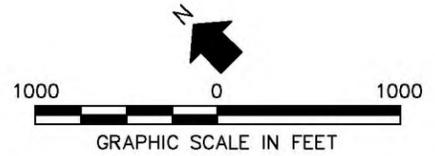
FIGURE
2.3-3

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 2.3-4.dwg 10/18/2019 13:43



PROPOSED PROJECTS	
SA-01	CIVIL ENGINEER CONTRACTING USACE COMPLEX
SA-02	LOGISTICS READINESS SQUADRON COMPLEX
SA-05	NEW LODGING FACILITIES
SA-06	DORM COMPLEX
SA-08	325 FW HEADQUARTERS BUILDING
SA-09	CHAPEL
SA-10	COMMUNITY COMMONS FACILITY
SA-11	TYNDALL AFB GATE COMPLEXES (SUPPORT)

LEGEND	
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION



**SUPPORT AREA PROJECTS AND CONSTRAINTS
 (ALTERNATIVE B)**

FIGURE
 2.3-4

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

2.3.3 9700 AREA ALTERNATIVES

Besides the 9700 Area proposed action alternative shown on **Figure 1.4-3**, the Air Force investigated the following alternative courses of action to 9700 Area projects defined in **Sections 1.4** of this EA. The candidate locations are shown on **Figure 2.3-5**. Adjacent planning constraints (i.e., natural resources, institutional controls boundaries) were considered where present. Each alternative is assessed in further detail in the following sections, including an assessment of whether or not it conforms to applicable universal and project-specific selection standards summarized on **Table 2.3-4**.

Alternatives Considered:

- ***Proposed Action Alternative (Figure 1.4-3):*** The proposed action alternative is the Air Force Preferred Alternative for the reconstruction of the 9700 Area, maximizing operational synergies with Rapid Engineers Deployable Heavy Operations Repair Squadron Engineers (RED HORSE) and R&D functions, asset consolidation, perimeter and airspace security.
- ***Alternative A (Figure 2.3-6):*** Places AFCEC laboratory complex near RED HORSE mission, 1.5 miles along Farmdale Road from U.S. Highway 98. Provides visual screening being set back far from base roadways. Provides convenient access to training runway and Sky X demolition range. Located within restricted airspace to facilitate Remotely Piloted Aircraft (RPA) mission. Pertinent 9700 Area constraints are also shown on **Figure 2.3-6**.
- ***Alternative B (Figure 2.3-7):*** Locates new, consolidated laboratory facilities adjacent to existing AFCEC laboratories and administrative functions in Buildings 1117 and 1120. Limits available range area for robotics and RPA testing. Does not promote adjacency to RED HORSE mission and requires travel to Sky X range. Located near Flightline which is not conducive to RPA mission. Pertinent 9700 Area constraints are also shown on **Figure 2.3-7**.
- ***Alternative C (Figure 2.3-8):*** Repurposes and expands existing laboratory and administration facilities in Buildings 1117 and 1120. Does not provide consolidated laboratory campus or room or additional mission capacity or expansion. Does not promote adjacency to RED HORSE mission and requires travel to Sky X range. Located within restricted airspace to facilitate RPA mission. Pertinent 9700 Area constraints are also shown on **Figure 2.3-8**.
- ***Alternative D (Figure 2.3-9):*** Reconstructs existing complex in original location and re-utilizes existing infrastructure and facilities. Located within restricted airspace to facilitate RPA mission. Pertinent 9700 Area constraints are also shown on **Figure 2.3-9**.
- ***No Action Alternative:*** The No Action Alternative, AFCEC mission capabilities and structural/infrastructural requirements would not be restored.

Selection Standards Evaluation:

The results of the selection standards evaluation of the Proposed Action and alternatives is summarized on **Table 2.3-4**. As shown, Alternative A only partially satisfies SS-01, SS-02, and SS-03. Alternative A would not maximize facility consolidation, would result in AFCEC R&D testing and requirements group remaining geographically separated, and would site facilities within or adjacent to explosives safety setback areas. Alternative B satisfies SS-01 but does not satisfy SS-02 and only partially

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

satisfies SS-04. Alternative B would site AFCEC facilities within an incompatible land use zone and would not support the RPA missions. Alternative C does not satisfy SS-02 and only partially satisfies SS-01 and SS-04. Alternative C would not maximize consolidation or removal of obsolete facilities and would site AFCEC facilities within an incompatible land use zone. Alternative D satisfies SS-04 but does not satisfy SS-01 or SS-02. Therefore, Alternatives A, B, C, and D were not retained for further evaluation.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 2.3-4 SELECTION STANDARDS EVALUATION: 9700 AREA ALTERNATIVES

ID	Evaluation				
	Proposed Action Alternative (Figure 1.4-3)	Alternative A (Figure 2.3-6)	Alternative B (Figure 2.3-7)	Alternative C (Figure 2.3-8)	Alternative D (Figure 2.3-9)
SS-01	<u>Yes:</u> Consolidates all AFCEC assets into one campus.	<u>Yes/ Partially:</u> Facilities are spread across a large geographic area and although the alternative makes space in Building 1117 to consolidate some AFCEC functions, overall facility consolidation is not maximized.	<u>Yes:</u> Consolidates all AFCEC assets into one campus.	<u>Yes/Partially:</u> Provides mixed consolidation opportunities for most of existing AFCEC facility requirements by expanding existing building areas. Does not maximize consolidation or removal of obsolete facilities.	<u>No:</u> Reconstructs facilities in basically the same location/configuration as previous facilities, which are prone to flooding. Location directly adjacent to coastline and within storm zone does not promote resiliency of new facilities.
SS-02	<u>Yes:</u> Takes full opportunity of synergies with RED HORSE, consolidates all R&D testing and requirements group functions, and promotes adjacency to Sky X range. Provides secured perimeter and entry control point.	<u>Yes/Partially:</u> Although siting near the RED HORSE mission could increase adjacency and efficiency, the AFCEC R&D testing group and requirements group remain geographically separated. Provides entry control point.	<u>No:</u> Operational efficiency and mission adjacency opportunities are missed in that the facilities are separated from the RED HORSE mission and use of the Sky X range requires travel across the installation.	<u>No:</u> Operational efficiency and mission adjacency opportunities are missed in that the facilities are separated from the RED HORSE mission, and use of the Sky X range requires travel across the installation.	<u>No:</u> Overall response times are the greatest of all alternatives considered, due to remote location and distance of over ten miles from Support Area.
SS-03	Not applicable.				
SS-04	<u>Yes:</u> Some project areas intersect known wetlands and floodplains, but could potentially be avoided/mitigated with project design measures.	<u>Yes/Partially:</u> Although location in restricted airspace is supportive of the RPA mission, facilities are sited within or adjacent to explosives safety setbacks. Some project areas intersect known wetlands and floodplains, but could potentially be avoided/mitigated	<u>Yes/Partially:</u> Some project areas intersect known wetlands and floodplains, but could potentially be avoided/mitigated with project design measures. However, AFCEC testing facilities are an incompatible land use with nearby dormitory facilities. Does	<u>Yes/Partially:</u> Some project areas intersect known wetlands and floodplains, but could potentially be avoided/mitigated with project design measures. However, AFCEC testing facilities are an incompatible land use with nearby dormitory facilities. Does	<u>Yes/Partially:</u> Although location is restricted airspace is supportive of RPA mission, facilities are unavoidably sited completely within wetlands and floodplains. Facilities are sited completely within ERP sites but interaction can be mitigated using design measures and obeying

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

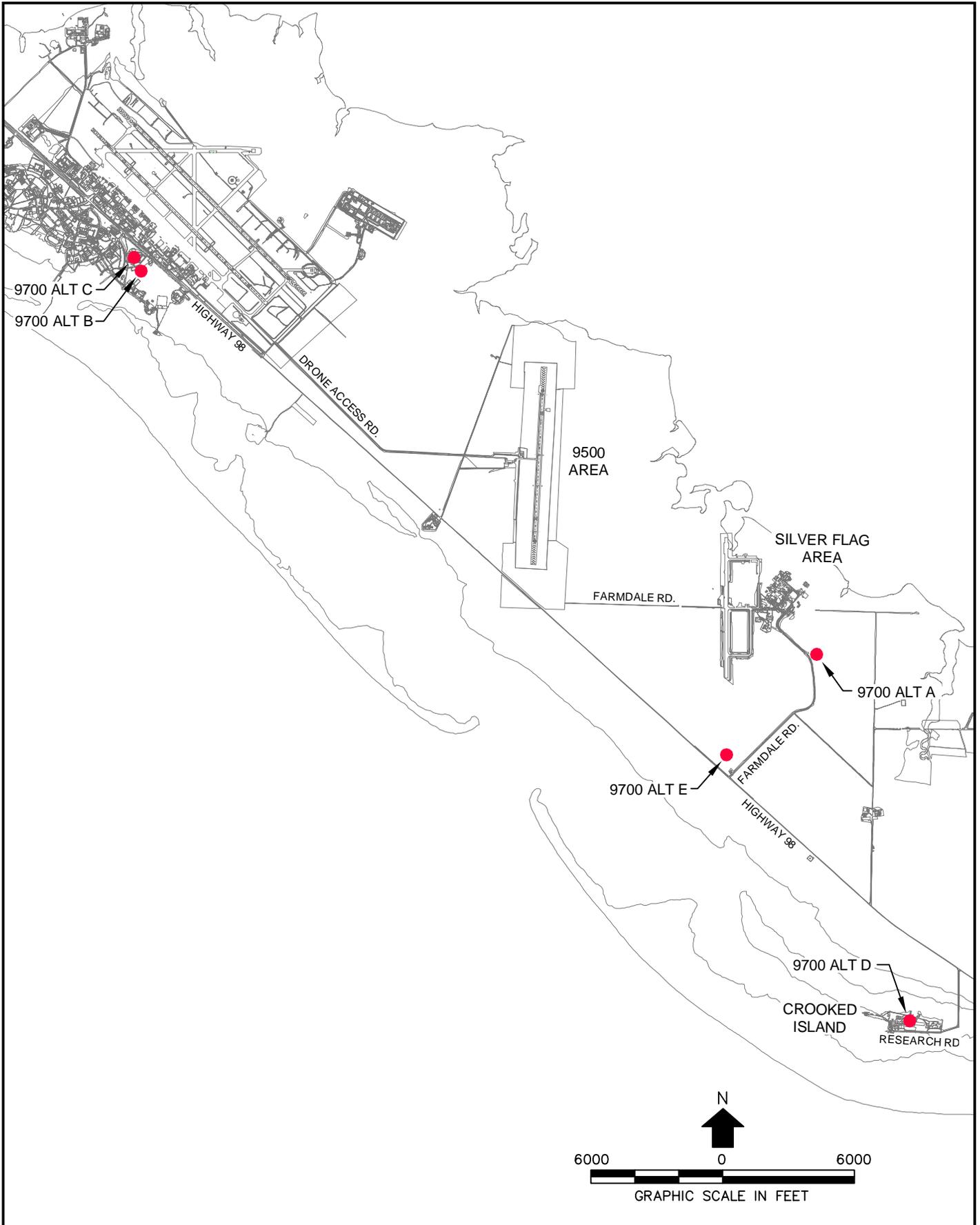
		with project design measures.	not support RPA mission due to proximity to Flightline.	not support RPA mission due to proximity to Flightline.	institutional controls/best practices during construction.
--	--	-------------------------------	---------------------------------------------------------	---------------------------------------------------------	------------------------------------------------------------

Selection Standards Legend:

- SS-01: Supports DoD Infrastructure Investment Strategy objectives
- SS-02: Complies with mission needs
- SS-03: Supports MWR programs
- SS-04: Avoids/minimizes operational and environmental constraints

Color Legend:

- Green** – Alternative meets selection standard. (or “mostly meets”)
- Yellow** – Alternative partially meets selection standard. (or “meets some but not most”)
- Red** – Alternative does not meet selection standard. (or “does not meet most”)

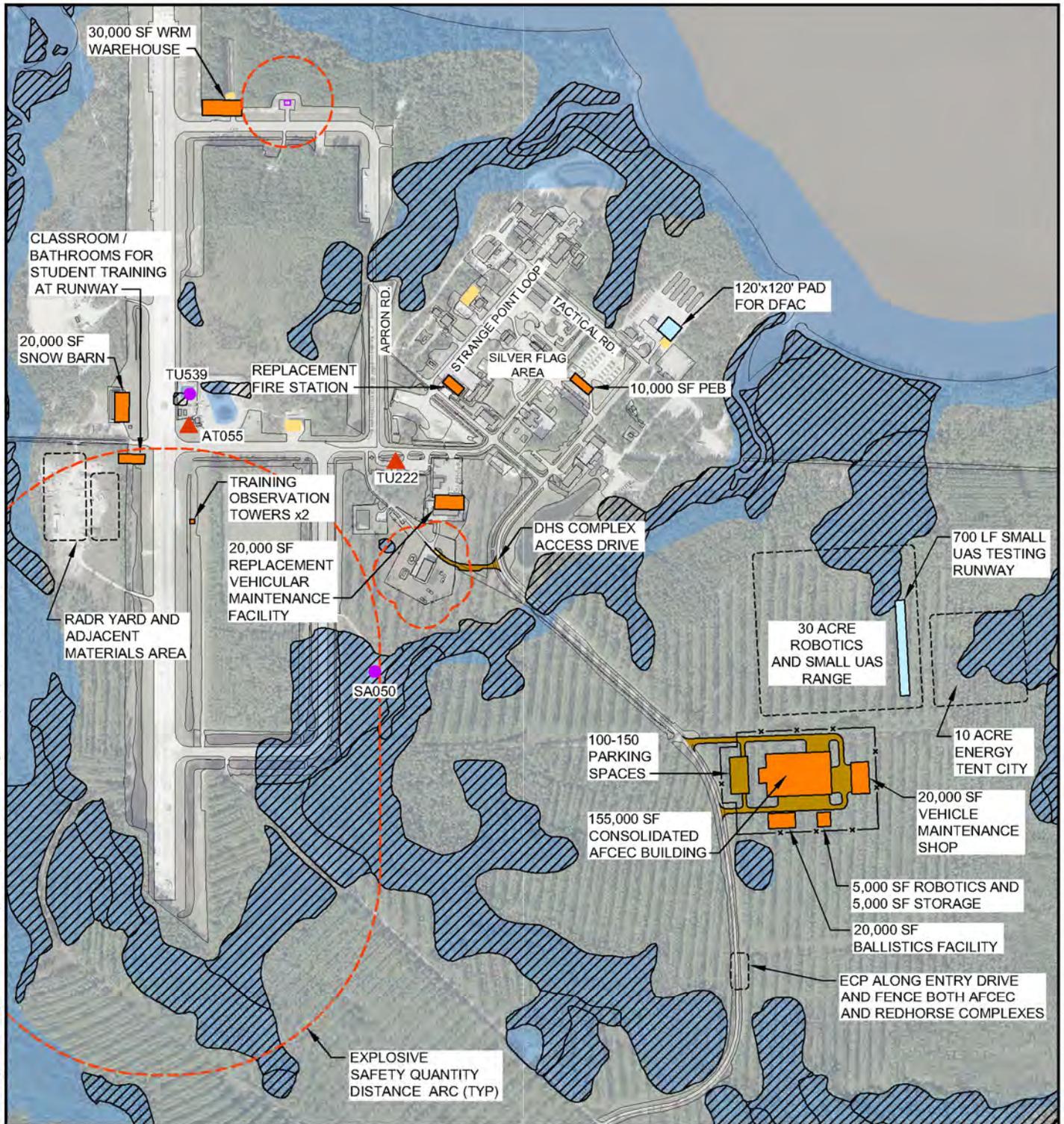


 Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT

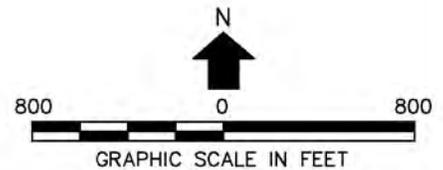
9700 AREA PROJECTS
ALTERNATIVES
LOCATION MAP

FIGURE
2.3-5

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25--SKETCHES\Exhibits\FIG 2.3--6.dwg 10/18/2019 13:46



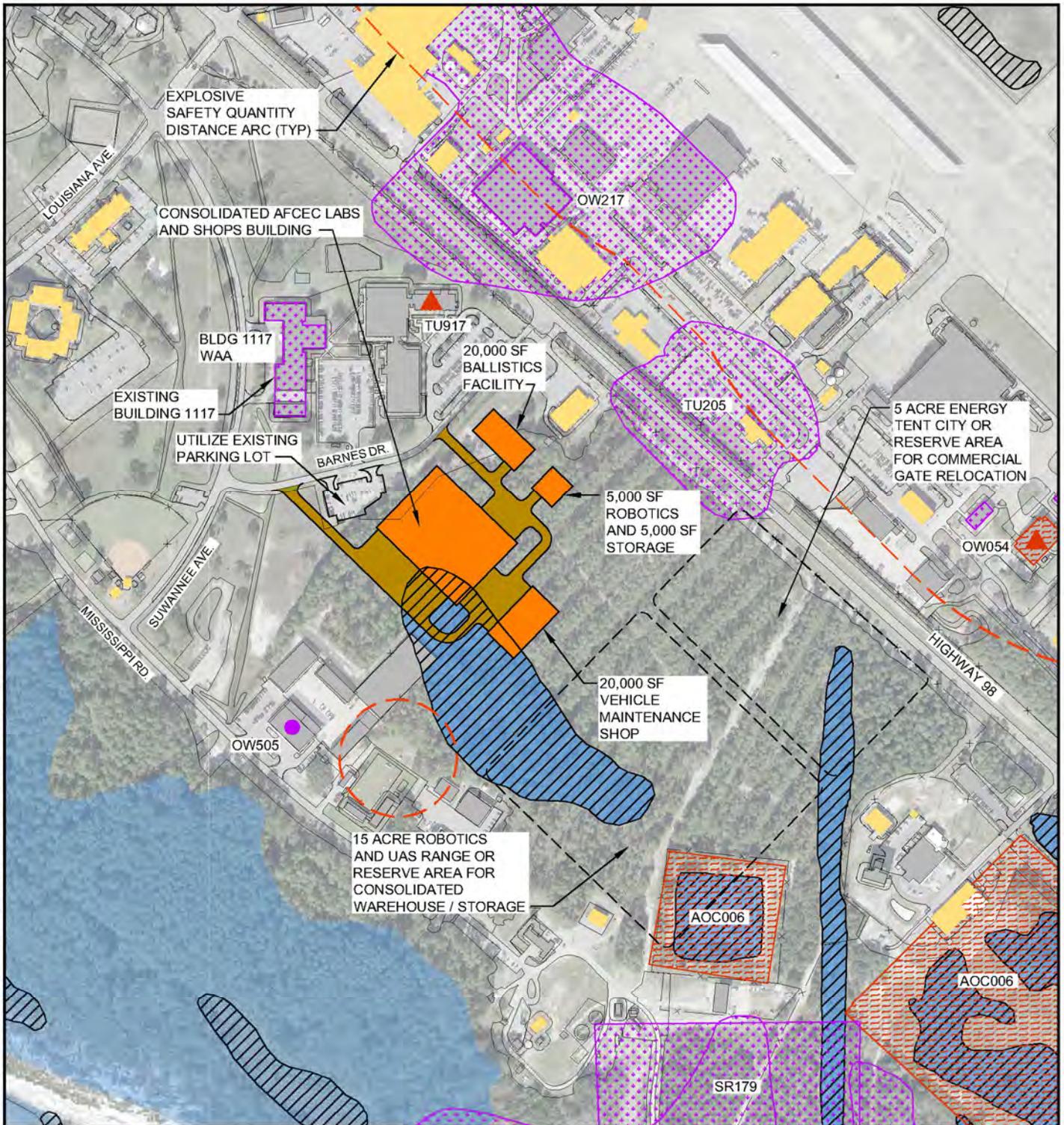
LEGEND	
	NEW BUILDING
	NEW ROAD / PARKING
	NEW PAVEMENT
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION



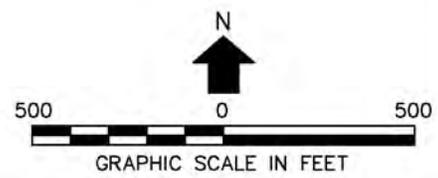
Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

9700 AREA PROJECTS AND CONSTRAINTS (ALTERNATIVE A)

FIGURE 2.3-6



LEGEND	
	NEW BUILDING
	NEW ROAD / PARKING
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION

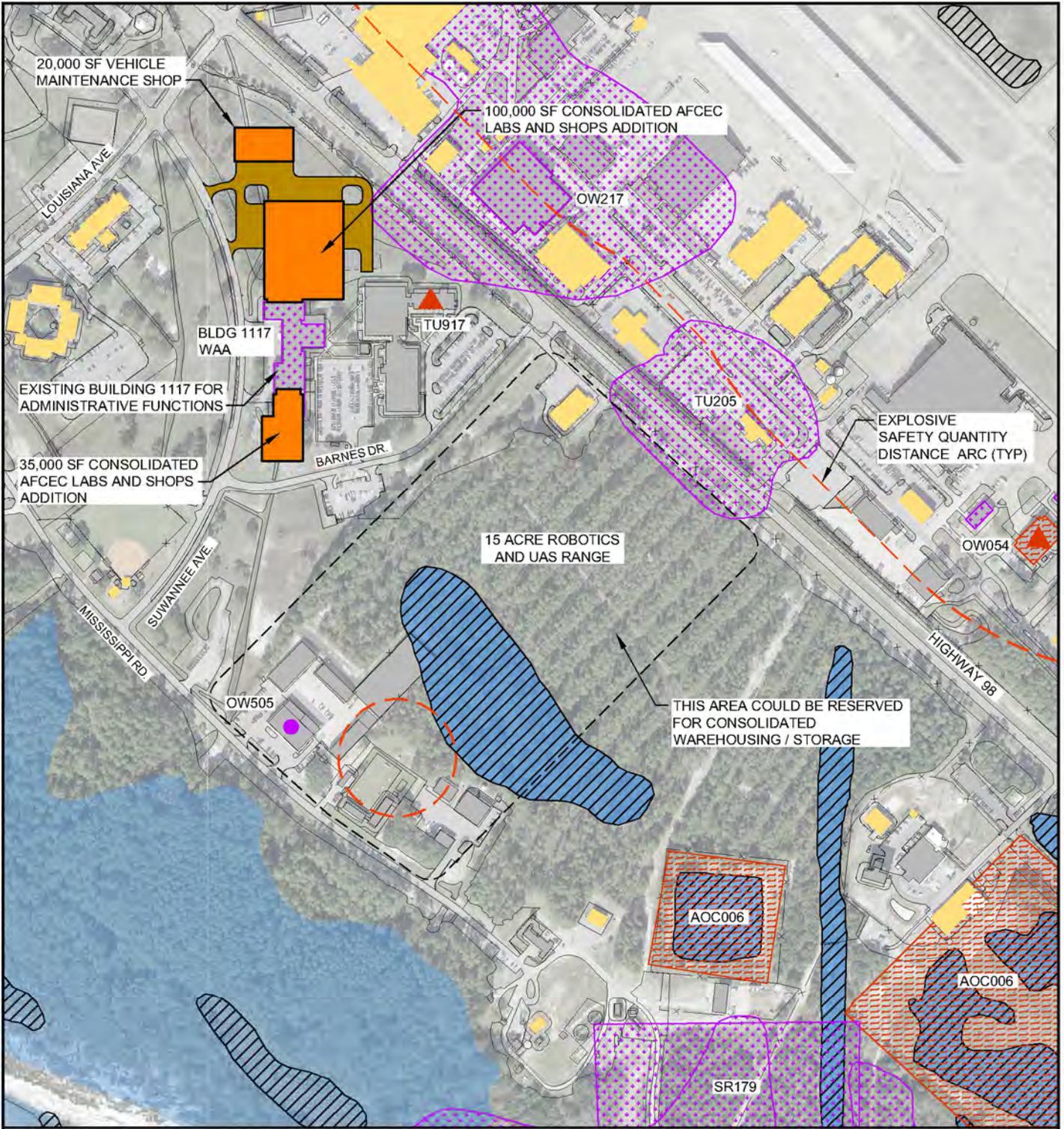


Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

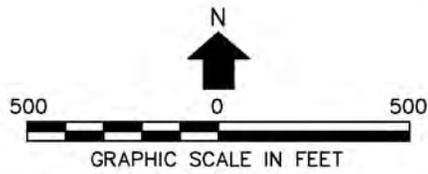
9700 AREA PROJECTS AND CONSTRAINTS (ALTERNATIVE B)

FIGURE 2.3-7

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25-SKETCHES\Exhibits\FIG 2.3-8.dwg 10/18/2019 13:49



LEGEND	
	NEW BUILDING
	NEW ROAD / PARKING
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	ACTIVE RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION

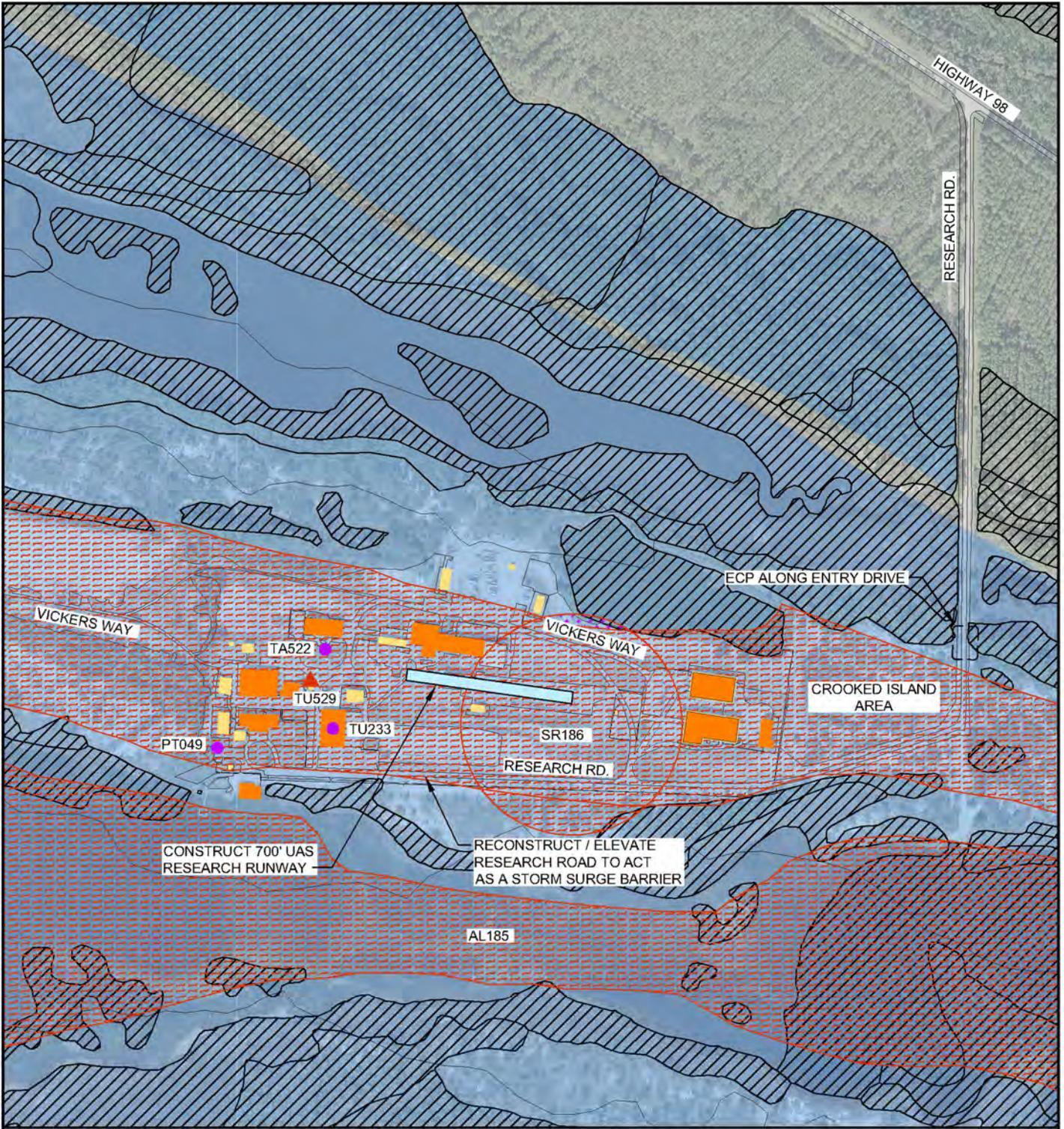



Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

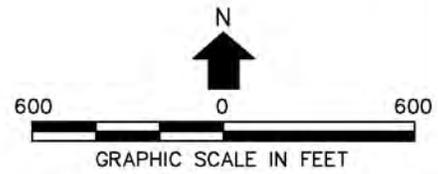
9700 AREA PROJECTS AND CONSTRAINTS (ALTERNATIVE C)

FIGURE 2.3-8

S:\Projects\G\GSRC\60610846 Tyndall AFB EA\900 Work\910 CAD\25--SKETCHES\Exhibits\FIG 2.3--9.dwg 10/18/2019 13:50



LEGEND	
	RENOVATED OR REPLACED BUILDING IN SAME LOCATION
	NEW UAS RESEARCH RUNWAY
	BUILDING / STRUCTURE TO BE REMOVED
	FLOODPLAIN
	WETLAND
	RESTORATION SITE
	CLOSED RESTORATION SITE NO FURTHER ACTION



Tyndall Air Force Base, Panama City FL
ENVIRONMENTAL ASSESSMENT FOR HURRICANE RECOVERY AND INSTALLATION DEVELOPMENT

9700 AREA PROJECTS AND CONSTRAINTS (ALTERNATIVE D)

FIGURE 2.3-9

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

2.3.4 Alternatives Considered for Remaining Projects

2000 Area Project Alternatives:

Besides the proposed action alternative shown on **Figures 1.4-1a** and **1c**, the Air Force considered the merits of the No Action Alternative to restoring recreational facilities in the 2000 Area. With the No Action Alternative, airmen and their families as well as visitors to Tyndall AFB, would lose access to marina amenities and sports and recreational amenities that were available in pre-hurricane conditions. Per AFI 34-101, *Morale, Welfare and Recreation Programs and Use Eligibility*, outdoor recreation capabilities support mission readiness through programs and facilities delivering Airmen and family resilience and readiness. Outdoor recreation also enhances team building and unit cohesion and trust among Airmen (Air Force, 2019). Therefore, the Air Force has identified the proposed action alternative shown on **Figures 1.4-1a** and **1c** as the Preferred Alternative for 2000 Area projects in alignment with selection standard SS-03 (**Table 2.3-1**).

8500 Area Project Alternatives:

Besides the proposed action alternative shown on **Figures 1.4-2** and **2a**, the Air Force considered the merits of the No Action Alternative to reconstructing Subscale Drone and related facilities in the 8500 Area. With the No Action Alternative, the 53 WEG Subscale Drone mission would not be fully supported as it was prior to the hurricane. The facilities in the Subscale Drone complex need to be collocated for operational efficiency and mission support, located near the drone runway, and located within and adjacent to compatible land uses. Available locations and configurations that would fully support the mission are limited to the proposed action alternative. Therefore, the Air Force has identified the proposed action alternative shown on **Figure 1.4-2** as the Preferred Alternative for 8500 Area projects in alignment with selection standards SS-01, SS-02, and SS-04 (**Table 2.3-1**).

Silver Flag Area Project Alternatives:

Besides the proposed action alternative shown on **Figures 1.4-5**, the Air Force considered the merits of the No Action Alternative to restoring training and support facilities in the Silver Flag Area. With the No Action Alternative, hurricane-damaged or destroyed buildings that support the training and other activities at Silver Flag would not be replaced. This would continue to impede the RED HORSE training activities located at the site. Facility siting and planning efforts to restore and maximize site functionality are constrained by the location and configuration of the Silver Flag area. The proposed action alternative would restore and maximize site functionality and fully meet mission needs within existing constraints. Therefore, the Air Force has identified the proposed action alternative shown on **Figure 1.4-5** as the Preferred Alternative for Silver Flag Area projects in alignment with selection standards SS-01, SS-02, and SS-04 (**Table 2.3-1**).

Multi-Area Building Demolition Alternatives:

Besides the proposed action alternative shown on **Figure 1.4-7a**, the Air Force considered the merits of the No Action Alternative to demolishing the over 200 buildings identified in **Appendix A** of this EA.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

With the No Action Alternative, the buildings listed in **Appendix A** would remain in place, which the Air Force determined would substantially impede mission rebuild capabilities and would compromise the health and safety of airmen and installation personnel. Therefore, the Air Force has identified the proposed action alternative shown on **Figure 1.4-7a** and detailed in **Appendix A** as the Preferred Alternative for demolition activities in alignment with selection standards SS-01 and SS-02 (**Table 2.3-1**).

Multi-Area Airfield Drainage Alternatives:

Besides the proposed action alternative shown on **Figure 1.4-7b**, the Air Force considered the merits of the No Action Alternative to performing drainage improvements to the infield portions of the airfield. With the No Action Alternative, no stormwater ditches would be installed and no demolition of outdated, damaged, underutilized or derelict stormwater management structures would occur. Standing water would continue to persist on the airfield after rainfall events from inadequate drainage, which would continue to severely damage airfield pavements as well as attract unwanted wildlife. Therefore, the Air Force has identified the proposed action alternative shown on **Figure 1.4-7b** as the Preferred Alternative for demolition activities in alignment with selection standard SS-02 (**Table 2.3-1**).

Multi-Area Utility Corridor Project Alternatives:

Besides the proposed action alternative shown on **Figure 1.4-7b**, the Air Force considered the merits of the No Action Alternative to building the Multi-Area utility corridor to upgrade utilities and provide connections to newly constructed or relocated facilities. With the No Action Alternative, outdated and in some cases insufficient utility lines and connections would remain in place. No new utility corridors or rights-of-way would be provided and newly constructed or relocated facilities would not have utility connections. The configuration of the proposed utility corridor is necessary to provide utility service and connections to proposed new construction and the siting was designed to minimize or avoid environmentally sensitive areas. Therefore, the Air Force has identified the proposed action alternative shown on **Figure 1.4-7b** as the Preferred Alternative for the utility corridor project in alignment with selection standards SS-01, SS-02, and SS-03 (**Table 2.3-1**).

2.3.5 Alternatives Eliminated from Detailed Consideration

Per 32 CFR 989.8(c), the Air Force may expressly eliminate alternatives from detailed analysis. Reasonable selection standards were applied to determine whether or not action alternatives considered, including the proposed action alternative and No Action Alternative, were suitable for detailed evaluation in this EA. Only alternatives which fully satisfied applicable selection standards, as summarized on **Tables 2.3-1** through **2.3-4**, as well as the No Action Alternative, were retained for detailed environmental analysis in the remainder of this EA. Alternatives which did not meet or only partially met established selection standards were eliminated from further analysis.

This page intentionally left blank.

3.0 AFFECTED ENVIRONMENT

3.1 SCOPE OF THE ANALYSIS

The scope of this EA includes an analysis of effects resulting from the implementation of the Proposed Actions and No Action Alternative. Alternatives not fully achieving established selection standards, as discussed in **Section 2.3** of this EA, were not retained for detailed analysis. The EA environmental analysis process identifies and discloses potential effects on the natural and human environments in and surrounding Tyndall AFB. Impacts are identified and disclosed within established Regions of Influence (ROI) which are resource specific. For instance, the ROI for land use is entirely within the installation boundary, while the ROI for air quality is the entire airshed.

3.1.1 RESOURCES ANALYZED

Based on the components of the Proposed Actions, the Air Force determined that there would be temporary and short-term effects due to construction or demolition projects at Tyndall AFB, as well as long-term effects associated with the construction activities. As a result of this review, resource categories are evaluated: air quality; noise; safety and occupational health; land use; soils; water resources; biological resources; cultural resources; hazardous materials and waste; and socioeconomics.

3.1.2 RESOURCES ELIMINATED FROM DETAILED ANALYSIS

The Proposed Actions was determined to have no effect on several resources; therefore, these resources were eliminated from detailed analysis in this EA, in accordance with CEQ regulations. The resources that were eliminated from detailed analysis and the rationale for their elimination are presented in the subsections that follow.

3.1.2.1 Visual Resources

The Air Force anticipates no negative effects on or conflicts with visual resources as a result of the Proposed Actions at Tyndall AFB. The justification is that construction and/or improvement projects would 1) take place on the installation and be consistent with the existing visual landscapes; 2) primarily occur in the developed portion of the installation; 3) be built of materials similar to other structures on the installation; and 4) be landscaped consistent with the existing habitat. For these reasons, implementation of the Proposed Actions or No -Action Alternative would not have an adverse impact on the visual environment at Tyndall AFB or the lands surrounding the installation.

3.1.2.2 Airspace

The Proposed Actions do not include any beddown of additional units or increase in the number of aircraft or sorties operating out of Tyndall AFB. Therefore, the Proposed Actions would have no effect on the classification or parameters of any Special Use Airspace or any other existing airspace that overlies Tyndall AFB. The Proposed Actions would also have no potential to result in airspace restrictions or congestion, or otherwise impact military or non-military use of any airspace. For these reasons, the Proposed Actions would have no effect on airspace.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.1.2.3 Geology

The Proposed Actions would not involve any activity that would adversely affect subsurface geological formations. Construction of the new structures and demolition of the existing buildings would be conducted using standard methods that would have no appreciable impact on geology such as site clearing, grading, and compacting. Excavation is expected to be conducted only to depths necessary for the facility foundation and utility connections. For these reasons, the Proposed Actions would have no appreciable effect on geology.

3.2 AIR QUALITY AND CLIMATE CHANGE

Air quality impacts can range from localized effects to the dispersal and transport of air pollutants across large geographic areas. For the purposes of the air quality impact assessment, potential air emissions associated with the Proposed Actions are quantified and disclosed, compared against any applicable thresholds, and discussed in the context of the airshed and air quality control framework applicable to Bay County. For this EA, the applicable ROI is the airshed within which Bay County resides. However, the nature and magnitude of the Proposed Actions are expected to create only localized impacts to the area surrounding Tyndall AFB within this airshed.

3.2.1 NATIONAL AMBIENT AIR QUALITY STANDARDS

Pursuant to the CAA and its amendments, the U.S. Environmental Protection Agency (USEPA) identifies air pollutants that cause or contribute to the endangerment of human health and or environmental welfare and establishes air quality “criteria” that guide the establishment of air quality standards to regulate these pollutants (42 U.S.C. Sections 7408 - 7409). To date, the USEPA has established such criteria for six air pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), particulate matter less than ten micrometers in diameter (PM₁₀), and sulfur dioxide (SO₂), and has subsequently promulgated National Ambient Air Quality Standards (NAAQS) meant to safeguard public health (i.e., primary NAAQS) and environmental welfare (i.e., secondary NAAQS). Current NAAQS are presented in **Table 3.2-1**.

Areas where monitored outdoor air concentrations are within an applicable NAAQS are considered in attainment of that NAAQS. If sufficient ambient air monitoring data are not available to make a determination, the area is instead deemed attainment/unclassifiable. Areas where monitored outdoor air concentrations exceed the NAAQS are designated by the USEPA as nonattainment areas. Nonattainment designations for some pollutants (e.g., O₃) can be further classified based on the severity of the NAAQS exceedances. Lastly, areas that have historically exceeded the NAAQS, but have since instituted controls and programs that have successfully remedied these exceedances are known as maintenance areas. Currently, Bay County is considered attainment of all NAAQS (Air Force, 2019a).

State agencies having nonattainment or maintenance areas within their jurisdiction are charged with developing air quality control plans, called State Implementation Plans (SIP), that include strategies and measures to bring the area back into compliance with the NAAQS by a USEPA-prescribed deadline. SIPs are also devised to maintain compliance with a NAAQS once attainment is achieved.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.2-1 NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Level	Form
CO	8-hour	9 ppm	Not to be exceeded more than once per year
	1-hour	35 ppm	
Pb	Rolling 3-month average	0.15 $\mu\text{g}/\text{m}^3$	Not to be exceeded
NO ₂	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, 3-year average
	Annual	53 ppb	Annual mean
O ₃	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, 3-year average
PM	PM _{2.5} Annual (primary)	12 $\mu\text{g}/\text{m}^3$	Annual mean, 3-year average
	PM _{2.5} Annual (secondary)	15 $\mu\text{g}/\text{m}^3$	Annual mean, 3-year average
	PM _{2.5} 24-hour	35 $\mu\text{g}/\text{m}^3$	98th percentile, 3-year average
	PM ₁₀ 24-hour	150 $\mu\text{g}/\text{m}^3$	Not to be exceeded more than once per year, 3-year average
SO ₂	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, 3-year average
	3-hour	0.5 ppm	Not to be exceeded more than once per year

Notes: ppb = parts per billion; ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter of air.
Source: USEPA, 2019a.

To gauge compliance with the NAAQS and pursuant to USEPA requirements, the FDEP Division of Air Resource Management has established and maintains a permanent network of ambient air monitors across the state, including areas within and surrounding Bay County. One monitoring station is located within 8 miles of Tyndall AFB. This station collects data for O₃. Additional ambient air quality monitors are located 67 miles (O₃ and PM₁₀), 80 miles (O₃ and PM_{2.5}), 87 miles (O₃, PM₁₀, PM_{2.5}, and SO₂), 117 miles (Pb), and 177 miles (O₃, nitrogen oxides [NO_x], PM_{2.5}, and SO₂) from Tyndall AFB. **Table 3.2-2** summarizes O₃ data collected over the period of 2016 to 2018 at the nearest station.

The monitoring data demonstrate that concentrations of O₃, in the area surrounding Tyndall AFB are well below applicable NAAQS. No violations of the NAAQS are registered for the pollutant measured.

TABLE 3.2-2 AIR MONITORING DATA SUMMARY

NAAQS				USEPA Monitor ID# (Distance and Direction from Tyndall AFB)
Pollutant	Primary/Secondary	Averaging Time	Level	12-005-0006 (8 miles northwest)
O ₃	Primary and Secondary	8 hours	0.070 ppb	0.060

Source: USEPA, 2019b.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.2.2 EXISTING AIR QUALITY CONDITIONS

3.2.2.1 Clean Air Act Conformity

The General Conformity Rule of the Federal CAA mandates that the Federal government not engage, support or provide financial assistance for licensing or permitting, or approve any activity not conforming to an approved SIP. This rule applies to all Federal actions except highway and transit actions which are instead regulated by the Transportation Conformity Rule. The rule takes into account air pollutant emissions associated with actions that are Federally funded, licensed, permitted, or approved, and ensures that such emissions do not cause or contribute to air quality degradation, thus preventing the achievement of state and Federal air quality goals.

Air Force Policy Directive (AFPD) 32-70, *Environmental Considerations in Air Force Programs and Activities*, mandates that the Air Force comply with all Federal, state and local environmental laws and standards. In accordance with AFPD 32-70, AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, explains responsibilities and specifics on how to assess, attain and sustain compliance with the CAA and other Federal, state and local air quality regulations. This AFI provides further and more specific instruction on the requirements of the Air Force's EIAP for air quality promulgated at 32 CFR 989.30, which mandates that EIAP documents such as this EA address General Conformity.

Because Bay County and the surrounding area meets all NAAQS, the region is considered in attainment for all pollutants (Air Force, 2019c). Therefore, the State of Florida is not required to develop an emissions inventory or attainment demonstration SIP for the region, and the General Conformity Rule does not apply to the Proposed Actions.

3.2.2.2 Hazardous Air Pollutants

In addition to the criteria pollutants discussed above, non-criteria toxic pollutants, called hazardous air pollutants (HAPs), are also regulated under the CAA. The USEPA has identified a total 187 HAPs that are known or suspected to cause health effects in small doses. HAPs are emitted by a wide range of man-made and naturally occurring sources including combustion mobile and stationary sources. However, unlike the NAAQS for criteria pollutants, Federal ambient air quality standards do not exist for non-criteria pollutants.

3.2.2.3 Stationary and Mobile Source Emissions

No new major stationary sources are associated with the Proposed Actions at Tyndall AFB. New major stationary sources are subject to Prevention of Significant Deterioration and/or New Source Review programs to ensure that these sources are constructed without significant deterioration of the air in the area. The USEPA oversees programs for stationary source operating permits (Title V) and for new or modified major stationary source construction and operation. Mobile sources are regulated under the CAA Title II through enforcing emissions standards on sources manufactured.

Tyndall AFB has a Federally Enforceable State Operation Permit, under Florida Statutes (F.S.) Chapter 403. Installation sources regulated by the permit include paint booths, fuel fill stands, jet engine testing, fuel tanks external combustion equipment (including boilers), and stationary emergency reciprocating

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

internal combustion engines (emergency generators). The permit requires Tyndall AFB's permitted sources to emit less than 90 tons per year each for CO, SO₂, and NO_x; 80 tons per year of Volatile Organic Compounds (VOC); and 8 and 21 tons per year for individual and total HAPs respectively to avoid being a major source with respect to Title V (FDEP, 2015). **Table 3.2-3** summarizes Tyndall AFB's calendar year 2018 stationary source permitted emissions report (FDEP, 2018).

TABLE 3.2-3 AIR QUALITY PERMIT EMISSIONS REPORT – TYNDALL AFB 2018

Pollutant	Tons Per Year	Permit Limit	In Compliance?
CO	8.05	90	Yes
NO _x	19.57	90	Yes
PM _{2.5}	1.09	--	--
PM ₁₀	1.09	--	--
SO ₂	1.29	90	Yes
VOC	4.50	80	Yes
HAPs	0.52	21	Yes

Source: FDEP, 2018.

3.2.2.4 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect. The greenhouse effect is a natural phenomenon where gases trap heat within the lowest portion of the earth's atmosphere, causing heating at the surface of the earth. The primary long-lived GHGs directly emitted by human activities are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

The heating effect from these gases is considered the probable cause of the global warming observed over the last 50 years (USEPA, 2009a). Global warming and climate change can affect many aspects of the environment. The USEPA has recognized potential risks to public health or welfare and signed an endangerment finding regarding GHGs under Section 202(a) of the CAA (USEPA, 2009b), which finds that the current and projected concentrations of the six key well-mixed GHGs – CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆ – in the atmosphere threaten the public health and welfare of current and future generations. Emissions of GHGs estimated for the Proposed Actions are discussed in **Section 4.1.1.6** of this EA.

3.3 NOISE

Sound is defined as a particular auditory impact produced by a given source, for example the sound of rain on a rooftop. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory impact. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. Noise can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between the source and receptor, receptor sensitivity, and time of day. Affected receptors are specific (e.g., residential areas, schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists. These are generally referred to as noise sensitive receptors.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Sound levels vary with time. For example, the sound increases as an aircraft approaches, then falls and blends into the ambient, or background, as the aircraft recedes into the distance. Because of this variation, it is often convenient to describe a particular noise "event" by its highest or maximum sound level (L_{max}). It should be noted that L_{max} describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical L_{max} levels may produce very different total noise exposures. One may be of very short duration, while the other may last much longer.

Human response to noise varies, as do the metrics used to quantify it. Generally, sound can be calculated with instruments that record instantaneous sound levels in decibels (dB). An A-weighted decibel (dBA) is the unit used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA, 1981a). **Table 3.3-1** compares common sounds and shows how they rank in terms of auditory impacts. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10-dBA increase seems twice as loud (USEPA, 1981b).

TABLE 3.3-1 SOUND LEVELS AND HUMAN RESPONSE

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying
110	Pile drivers	Strained vocal effort
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA, 1981a.

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed to is 115 dBA, and exposure to this level must not exceed 15 minutes within an 8-hour period. These standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

The average day/night sound level (DNL) metric is a measure of the total community noise environment. DNL is the average A-weighted sound level over a 24-hour period, with a 10-dBA adjustment added to the nighttime levels (between 2200 and 0700 hours). This adjustment is an effort to account for increased human sensitivity to nighttime noise events. DNL was endorsed by the USEPA for use by Federal agencies and was adopted by the U.S. Department of Housing and Urban Development. DNL is an accepted unit for quantifying annoyance to humans from general environmental noise, including aviation and construction noise. Land use compatibility and incompatibility are determined by comparing the predicted DNL at a site with the recommended land uses. Noise levels occurring at night generally produce a greater annoyance than those of the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA louder than those occurring during the day, at least in terms of its potential for causing community annoyance.

Due to the DNL descriptor's close correlation with the degree of community annoyance from aircraft noise, most Federal agencies have formally adopted DNL for measuring and evaluating aircraft noise for land use planning and noise impact assessment. Federal committees such as the Federal Interagency Committee on Urban Noise and the Federal Interagency Committee on Noise, which include the USEPA, the Federal Aviation Administration (FAA), DoD, Department of Housing and Urban Development, and the Veterans Administration, found DNL to be the best metric for land use planning. They also found no new cumulative sound descriptors or metrics of sufficient scientific standing to substitute for DNL.

DNL accounts for the noise levels in terms of sound exposure level of all individual aircraft events, the number of times those events occur, and the period day/night in which they occur. Values of DNL can be measured with standard monitoring equipment or predicted with computer models such as NOISEMAP.

AFI 32-7063, *Air Installations Compatible Use Zone (AICUZ) Program*, requires plotting DNL contours of 65, 70, 75, 80, and 85 dB for use in analyzing land use compatibility for both the current mission and the projected mission in the 5- to 10-year range. Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*, requires the use of NOISEMAP to produce these noise contours and to analyze noise levels at noise-sensitive areas, except at major commercial airports where the NEPA noise requirement is met by using the FAA methodology and noise model.

The ambient noise environment at Tyndall AFB is affected by U.S. DoD aircraft operations, including Air Force, Army, Navy, and Marine Corp aircraft and military vehicles. A noise analysis was completed at Tyndall AFB in 2016 in support of the AICUZ Study (Air Force, 2016b). These noise contours included noise data from all aircraft operations associated with Tyndall AFB, and projected the 2016 noise condition and represents the existing condition at Tyndall AFB. According to the 2016 AICUZ, approximately 166 acres of off-airport land is contained within the DNL 65 dB or higher noise contours. According to the AICUZ, a population of approximately 212 persons is contained within these contours (Air Force, 2016b).

Other than residential land uses on the mainland north and west of Tyndall AFB, the AICUZ did not identify any additional Noise Sensitive Sites (NSS) within the noise contour, which would include religious institutions, educational facilities and health care facilities. Most NSS on or near Tyndall AFB have been damaged by Hurricane Michael and in in the process of or planned for demolition. However, a review of on base facilities indicates that on base NSS that are currently in use or will be rebuilt, include

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Visiting Officers Quarters (VOQs) and Visiting Airmen's Quarters (VAQs), a chapel, transient cabins, base housing, and Tyndall Elementary School.

3.4 SAFETY AND OCCUPATIONAL HEALTH

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. The elements of an accident-prone environment include the presence of a hazard and an exposed population at risk of encountering the hazard. Numerous approaches are available to manage the operational environment to improve safety, including reducing the magnitude of a hazard or reducing the probability of encountering the hazard. The primary safety categories discussed in this analysis include Construction and Demolition Safety and Mission Safety.

Factors involving primary occupational safety and health issues are addressed in the OSHA and Air Force Occupational Safety and Health (AFOSH) Standards. All day-to-day operations and maintenance activities on Tyndall AFB are performed by trained, qualified personnel in accordance with applicable equipment technical directives, approved occupational safety and health standards, and sound maintenance practices. The handling, processing, storage, and disposal of hazardous byproducts resulting from construction, demolition, operations, and maintenance are accomplished in accordance with the Federal and state requirements applicable to each substance.

Both natural and man-made environmental hazards may be present on base at any time due to the varied activities that take place at Tyndall AFB. Naturally-occurring potential health and safety hazards include insects, snakes, climactic conditions, and flash floods. Potential man-made health and safety hazards can include construction, demolition, transportation, maintenance and repair activities, the creation of noisy environments, and certain military activities. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

This analysis addresses the safety implications from construction, demolition, and other activities associated with the Proposed Actions. The safety-related ROI for this EA corresponds to the footprints of the individual Proposed Actions where construction, demolition and operational activities would occur. Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees, and implementation of operational practices that reduce risk of illness, injury, death, and property damage. The health and safety of on-site military and civilian workers, including construction contractors, are safeguarded by numerous DoD and Air Force regulations designed to comply with OSHA standards. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

3.4.1 CONSTRUCTION AND DEMOLITION SAFETY

All contractors performing construction and demolition activities on Air Force installations are responsible for following Federal OSHA regulations, as well as AFOSH standards set forth in AFI 91-202, *The Air Force Mishap Prevention Program*, (Air Force, 2017b), and AFMAN 91-203, *Air Force*

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Occupational Safety, Fire, and Health Standards. (Air Force, 2018c). AFOSH standards follow OSHA regulations and are required to conduct work activities in a manner that does not increase risk to workers or the public. The regulations address the health and safety of people at work and cover potential exposure to a wide range of chemical, physical, and biological hazards, and ergonomic stressors. Examples of activities that can be hazardous include transportation, maintenance and repair activities, and the creation of extremely noisy environments. 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.

Occupational health and safety are the responsibility of each employer, as applicable. Employer responsibilities are to review potentially hazardous workplace conditions; monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous substances), physical (e.g., noise propagation, falls), and biological (e.g., infectious waste, wildlife, poisonous plants) agents, and ergonomic stressors; and recommend and evaluate controls (e.g., prevention, administrative, engineering, PPE) to ensure exposure to personnel is eliminated or adequately controlled.

Additional health and safety risks to construction personnel exist in the form of munitions stored at various facilities within the MSA in the Flightline District and the possibility of encountering unexploded ordnances (UXO) within UXO probability areas (known munitions test/training areas). Proposed project F-10 (Flightline – MSA Facilities, 7000) would require construction and building renovation within the MSA Area. Proposed project M-03 (Building Demolitions) would include building demolition within the MSA. The Sky X Explosives Test Range is located in the southern portion of the Silver Flag district, roughly two miles south-southeast of the proposed location of Project SF-01 and would not be affected by the Proposed Actions.

For activities during which there is the potential for construction workers to encounter contamination from ERP sites, it is recommended that a health and safety plan be prepared in accordance with OSHA requirements prior to commencement of construction activities. Workers performing soil-removal activities within ERP sites are required to have OSHA 40-hour Hazardous Waste, Operations, and Emergency Response (HAZWOPER) training. In addition to this training, supervisors are required to have an OSHA Site Supervisor certification. Should contamination be encountered, the handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFI; and Tyndall AFB programs and procedures. HAZWOPER regulations that protect workers and the public at or near a hazardous waste cleanup site are discussed in 29 CFR 1910.120 and 29 CFR 1926. ERP sites at Tyndall AFB and their constraints and controls are further discussed in **Sections 3.10.5** and **4.9.1.5**.

3.4.2 MISSION SAFETY

Mission safety on Air Force installations is maintained through adherence to DoD and Air Force safety policies and plans. The Air Force safety program ensures the safety of personnel and the public on the installation by regulating mission activities. AFI 91-202 implements AFD 91-2, *Safety Programs*, (Air Force, 2019e), and provides guidance for implementing the safety program for all activities that occur on Air Force installations.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Tyndall AFB is a secure military installation with access limited to military personnel, civilian employees, military dependents, and approved visitors. Operations and maintenance activities conducted on the installation are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by AFOSH requirements. Adherence to industrial-type safety procedures and directives ensures safe working conditions.

Safety constraints such as ESQD arcs and UXO probability areas partially determine the suitability of areas for various land uses and, therefore, minimize safety hazards associated with mission activities. Although exposure of susceptible populations to safety hazards outside the safety constraints is unlikely, these constraints do not guarantee an absolute absence of risk. ESQD arcs are buffers around facilities that contain high-explosive munitions or flammable elements. The size and shape of an ESQD arc depends on the facility and the net explosive weight (NEW) of the munitions being housed. Separations set by ESQD arcs establish the minimum distances necessary to prevent the exposure of Air Force personnel and the public to potential safety hazards. Air Force protects personnel from the risks associated with UXO by controlling access to areas of concern; managing programs to remove UXO; and maintaining records of expenditures, range clearance operations, EOD incidents, and areas of known or suspected UXO.

Tyndall AFB aggressively manages its development program to ensure that it meets explosive safety requirements (Air Force, 2015a). There are 19 explosive safety zones at Tyndall AFB. Development not related to munitions is restricted within the ESQD arcs surrounding the MSA, airfields, the Silver Flag training site, explosive testing sites, and the EOD range. The most restrictive ESQD arcs constrain approximately 50 acres of developed land on the southwest end of the main aircraft parking apron. The land within the arc supports aircraft operations and maintenance facilities for the 53 WEG and 325 Maintenance Group and does not include apron pavements. The remainder of mission-essential land adjacent to the apron is unencumbered by ESQD arcs.

The Tyndall AFB MSA provides storage for munitions used on aircraft and space for weapons evaluations. The installation has storage capacity for up to 842,000 pounds NEW in 20 facilities including 16 igloos, three segregated magazines, and one storage, rocket checkout, and assembly facility.

3.5 LAND USE

The term land use refers to either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. For the Air Force, the term “land use” refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Air Force land use planning commonly use 12 general land use classifications: Airfield, Aircraft Operations and Maintenance, Industrial, Administrative, Community (Commercial), Community (Service), Medical, Housing (Accompanied), Housing (Unaccompanied), Outdoor Recreation, Open Space, and Water. As a part of the Comprehensive Planning Process, installations are divided into identifiable Planning Districts based on geographical features, land use patterns, building types, and/or transportation networks. The ROI for land use is the entirety of Tyndall AFB, which encompasses approximately 29,276 acres.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.5.1 EXISTING LAND USE

There are 13 distinct land use categories on Tyndall AFB. The land use categories include Administrative, Aircraft Operations and Maintenance, Airfield, Community (Commercial), Community (Service), Housing (Accompanied), Housing (Unaccompanied), Industrial, Medical/Dental, Open Space, Outdoor Recreation, Training, and Water. Existing land use complements the established planning districts with minimal adjacent incompatible land uses; however, there are notable operational inefficiencies resulting from similar and/or complementary functions being geographically separated, land use constraints and new and changing missions.

There are typical facilities that complement and are compatible with land use categories. Therefore, to supplement land use planning, Tyndall AFB further defines typical facilities/features and functions of land to encourage and plan for compatible development.

Hurricane Michael directly impacted land use and typical land use facilities by destroying or damaging facilities, thus altering the built environment from existing conditions prior to the storm. Every facility on the installation sustained at least some damage with more than 50 percent of the facilities being significantly damaged. Thus, support services, tenants and personnel are operating under temporary conditions conducting mission requirements in impermeant facilities with inadequate infrastructure and often co-located with dissimilar support organizations and geographically separated from complementary and compatibles facilities and support services. Significant inefficiencies in base functionality have been realized as a result of Hurricane Michael. While land use and the planning framework at Tyndall AFB cannot be physically damaged the realization and function of land was significantly impacted as a result of Hurricane Michael.

In response to the damage sustained at Tyndall AFB, the Air Force commissioned development of a new Master Plan in support of the re-build of Tyndall AFB. To provide a complete analysis of existing land use, this analysis provides pre- and post-storm conditions of land use as baseline conditions were significantly altered as a result of Hurricane Michael.

3.5.2 PLANNING DISTRICTS

Land use on Tyndall AFB is governed by a land use plan which provides direction for siting future improvement projects on the installation. The Tyndall AFB Installation Development Plan (IDP) (Air Force, 2015a) resulted from a comprehensive planning process that describes the installation's past, present and future physical state and serves as the guidance document for all future facility programming decisions. The Tyndall AFB IDP was created in accordance with AFI 32-7062, *Comprehensive Planning*, with principles from UFC 2-100-01, *Installation Master Planning*.

The four planning districts identified for Tyndall AFB are, Tyndall West, Support Area, Flightline Area, and Tyndall East. They are briefly described below (as they were prior to Hurricane Michael) and depicted on **Figure 3.5-1** (Air Force, 2015a). The Proposed Actions identified in **Section 1** refer to project areas, a further delineation of the planning districts, which organizes similar and compatible facilities/features and functions of land.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

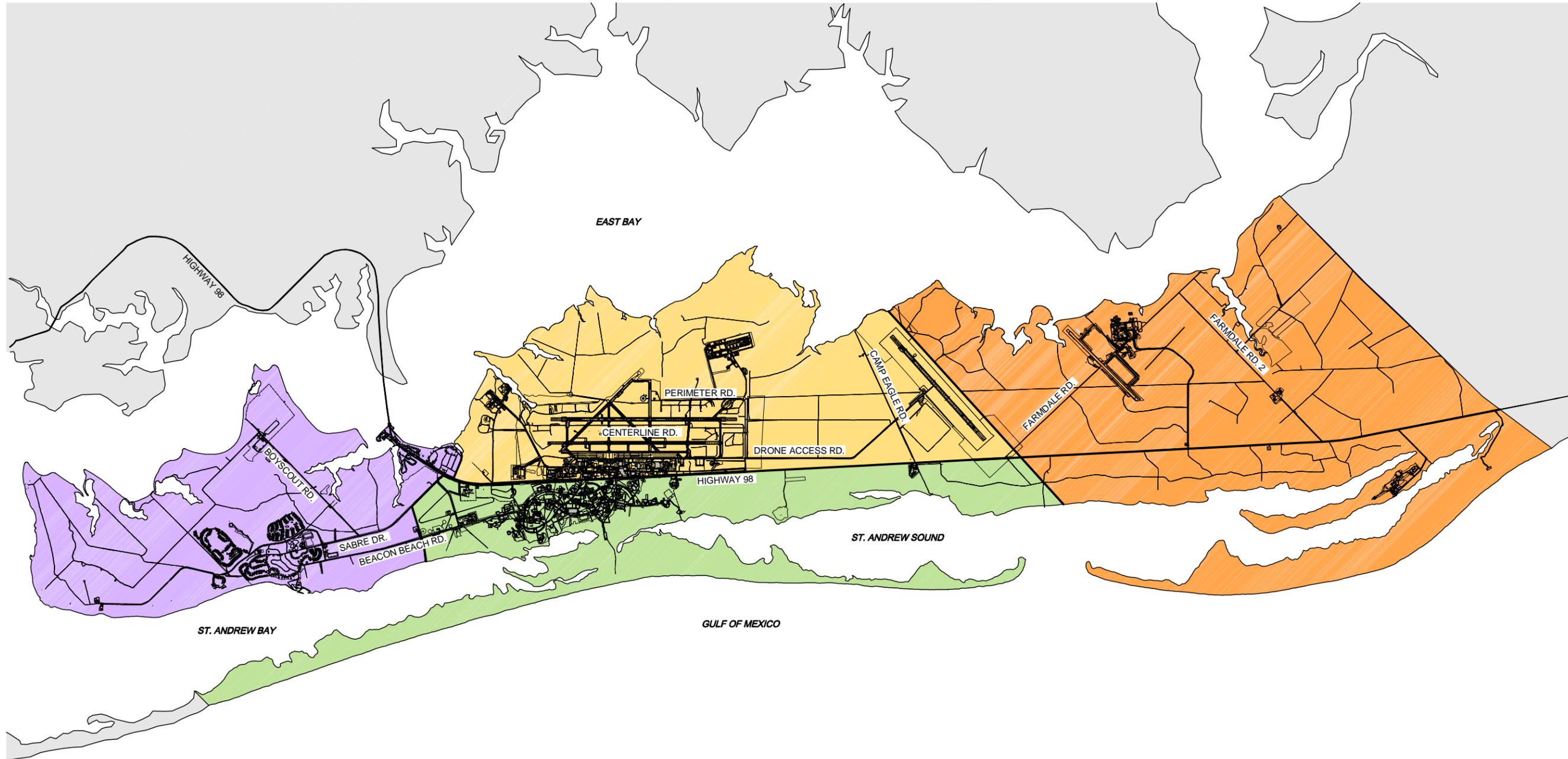
Tyndall West District. The Tyndall West District includes the advanced wastewater treatment plant, the closed Pelican Point Golf Course, privatized accompanied housing, and undeveloped land. U.S. Highway 98 divides 120 acres of accompanied housing to the north from the majority of the district between the highway and Saint Andrew Bay. The primary land use of the district is accompanied-housing. The 2000 Area Proposed Actions, as well as Site Development and Utilities and Building Demolitions associated with the Multi-Area Development Proposed Actions are located within this district.

Support Area District. The Support District is the community and mission support center of Tyndall AFB. The district includes the majority of installation administration space, the Base Exchange, commissary, dormitories, fitness center, dining facilities, lodging and medical facilities. The Support Area, 8500 Area Proposed Actions, as well as Site Development and Utilities and Building Demolitions associated with the Multi-Area Development Proposed Actions are located within this district.

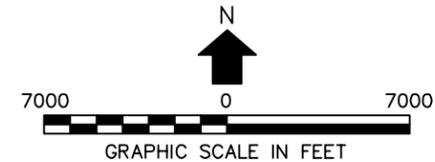
Flightline Area District. The Flightline District includes the installation's runways, accompanying taxiways, aprons, Flightline facilities that support the Flightline, MSA, fuel supply areas, and drone runway. The primary facilities within this district include aircraft hangars, aircraft maintenance units, base operations, the Air Traffic Control tower, and administrative facilities directly related to flight operations or aircraft maintenance. This district is predominantly industrial and mission oriented. Aircraft operations and maintenance, administrative, and industrial land uses directly affect Tyndall AFB's mission; therefore, this district includes the most important real estate on Tyndall AFB (Air Force, 2015a). The Flightline District is the most important for mission effectiveness and the most visible of the four planning districts. The Flightline Area Development Proposed Actions, as well as Airfield Drainage, Site Development and Utilities and Building Demolitions associated with the Multi-Area Development Proposed Actions are located within this district.

Tyndall East District. The Tyndall East District is east of the Flightline District and is primarily undeveloped. The district houses some training functions, including the 53 WEG subscale launch facilities, the AFCEC Sky 10 blast range, and the RED HORSE Silver Flag Site. U.S. Highway 98 bisects the district, creating two distinct parcels. The 9700 Area and Silver Flag Area Proposed Actions, as well as Site Development and Utilities and Building Demolitions associated with the Multi-Area Development Proposed Actions are located within this district.

Implementation of the proposed installation development projects to recover mission capabilities at Tyndall AFB would be constructed in all four planning districts. The existing land use and development are consistent within each planning district; however, each district has documented issues and recommended future planning recommendations to improve overall functionality of the installation and increase efficiencies of support and mission related operations (Air Force, 2015a).



LEGEND	
	FLIGHTLINE PLANNING DISTRICT
	SUPPORT PLANNING DISTRICT
	TYNDALL EAST PLANNING DISTRICT
	TYNDALL WEST PLANNING DISTRICT



PLANNING DISTRICTS

FIGURE 3.5-1

This Page Intentionally Left Blank

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.5.3 LAND USE CONSTRAINTS

DoD and Air Force have prescribed development principles and best practices for more efficient land use and resource conservation. These practices encourage infill development and other more efficient land development techniques to maximize resources before considering land acquisition or development on previously undeveloped land. Planning constraints establish the limitations associated with development at Tyndall AFB and affect the pattern, density, and placement of facilities and infrastructure and ultimately affect site planning decisions.

Land use constraints are elements of the natural or built environment that create limitations on the operation of the base's buildings, roadways, utility systems, airfields, training ranges and other infrastructure. Development constraints are categorized as operational, natural and environmental or built. These land use constraints are located throughout Tyndall AFB, spanning all four planning districts and are a consideration when planning for future development. Development constraints are briefly discussed below and throughout this EA.

Operational. Operational planning constraints are generally related to flight operations and maintenance of aircraft. These constraints include munitions, potentially hazardous cargo, training, ranges and similar operational requirements that can limit future development activity. Identified operational constraints at Tyndall AFB are associated with AICUZ, airfield clearances, antiterrorism, and ESQD arcs that could limit development potential. Operational constraints do not necessarily restrict mission expansion and growth potential at the installation because operational constraints are often also mission requirements.

Natural and Environmental. Environmental constraints include cultural and natural resources, ERP sites and hazardous/non-hazardous waste and material which can constrain development and restrict the location of mission activities. Potential natural planning constraints on Tyndall AFB include Bird Aircraft Strike Hazard, IRP, soils and geology, threatened and endangered species, topography and physiology, and wetlands and floodplains.

Built. Built constraints are related to the condition, functionality and effectiveness of infrastructure systems, facilities and other man-made improvements. Existing development at Tyndall AFB can create significant limitations to current and future missions. Identified built constraints at Tyndall AFB include historic structures, historical or archaeological sites, utility systems, airfield infrastructure, transportation infrastructure and facilities.

Prior to Hurricane Michael, developable areas and areas of potential redevelopment were identified within each planning district and were potentially available for new development or redevelopment (Air Force, 2015a). However, as a result of Hurricane Michael, land use constraints, most notably the built constraint, were significantly altered, thus shifting the existing future planning documents from a reactive framework to one of pro-active planning and affording the Air Force the opportunity to re-build Tyndall AFB in a manner that capitalizes on approved development principles and best practices for more efficient land use and resource conservation.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.6 SOILS

Soils at Tyndall AFB are formed from sandy, marine sediments and are predominately sandy, acidic, poorly drained, have low shrink-swell potential, and are relatively close to the underlying water table. There are 18 different soil types found on the project areas on Tyndall AFB. The characteristics of the major soil series and other soil types found on the installation are provided in **Table 3.6-1. Tables 3.6-2a** through **3.6-2g** identify soil types and acreages of soils included in each of the EA project areas Note that Project M-03 (Building Demolition) is not shown due to nature of project and low potential to disturb soils.

TABLE 3.6-1 SOIL TYPES AND CHARACTERISTICS REPRESENTED ON TYNDALL AFB

Soil Series	Depth to Water Table	Location	Characteristics
Allanton sand	At or near the surface	Nearly level or slightly depressional areas along poorly defined drainageways	Poorly drained soil, available water capacity is low to medium in surface and other layers, permeability is rapid to moderately rapid
Bayvi loamy sand	0 to 6 inches	Tidal marshes on marine terraces	Extremely acidic, very deep, poorly or very poorly drained, have a very low available water capacity, slow runoff, rapid permeability (but internal drainage is impeded by the high water table), very high surface runoff, and are very prone to flooding (especially during high tides)
Beaches	At the surface or 0 to 72 inches	Beaches on marine terraces	High salinity levels, inundated by high tide or wave action daily, subject to movement by wind and water, poorly drained
Chipley sand	30 to 60 inches	Gently sloping areas between upland and lower lying flatwoods	Somewhat poorly drained, available water capacity is low, rapid permeability
Fripp-Corolla complex	Greater than 72 inches	Undulating, dune like areas adjacent to the Gulf of Mexico	Permeability is very rapid, available water capacity is low, these soils are subject to storm tide flooding
Hurricane sand	24 to 42 inches	Flats and rises of marine terrace	Strongly acidic, very deep, very poorly drained, have a low available water capacity, very rapid permeability and negligible surface runoff, are not prone to ponding or flooding, but are very susceptible to wind erosion
Kureb sand	Below 80 inches	Broad upland areas near the coast	Excessively drained, have a very low available water capacity, and rapid permeability
Leon sand	6 to 18 inches	Flatwoods on marine terraces	Very strongly acidic, very deep, poorly drained, have a very low available water capacity, rapid permeability on the surface, high surface runoff, are not prone to ponding or flooding, but are very susceptible to wind erosion

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Soil Series	Depth to Water Table	Location	Characteristics
Mandarin sand	18 to 42 inches	Flats and rises of marine terraces	Very strongly acidic, very deep, somewhat poorly drained, have a low available water capacity, rapid permeability on the surface, very low surface runoff, are not prone to ponding or flooding, but are very susceptible to wind erosion
Osier fine sand	0 to 6 inches	Depressions on marine terraces and flatwood areas	Extremely acidic, very deep, poorly drained, have a low available water capacity, rapid permeability (but internal drainage is impeded by the high water table), negligible surface runoff, are not prone to flooding, but are prone to ponding, and are very susceptible to wind erosion
Pamlico-Dorovan complex	0 to 10 inches	Depressions along drainage ways	Very poorly drained, have a very high available water capacity, have moderate permeability, are not prone to flooding but frequently pond
Pickney	0 to 6 inches	Depressions on marine terraces	Very strongly acidic, very deep, very poorly drained, have a moderate available water capacity, rapid permeability on the surface (but internal drainage is impeded by the high water table), negligible surface runoff, are frequently prone to ponding and occasionally prone to flooding, and are very susceptible to wind erosion
Pits	Unknown	Varies	These areas consist of soil that has been excavated for use in road construction and as fill material in preparing sites for buildings
Pottsburg	0 to 6 inches	Flats of marine terraces	Very strongly acidic, very deep, poorly drained, have a low available water capacity, rapid permeability on the surface, negligible surface runoff, are not prone to ponding or flooding, and are very susceptible to wind erosion
Resota fine sand	42 to 60 inches	Ridges and knolls of marine terraces	Strongly acidic, very deep, moderately well drained, have a very low available water capacity, very rapid permeability on the surface, negligible surface runoff, are not prone to ponding or flooding, and are very susceptible to wind erosion
Rutledge sand	0 to 6 inches	Depressions on marine terraces	Strongly acidic, very deep, very poorly drained, have a low available water capacity, rapid permeability on the surface (but internal drainage is impeded by the high water table), negligible surface runoff, are not prone to flooding but frequently pond, and are very susceptible to wind erosion
Arents	8 to 36 inches	Rises on marine terraces	Man-made mixture of various soil series (from earth moving operations such as dredging and filling), neutral, very deep, somewhat poorly drained, have a very low available water capacity, variable permeability, negligible surface runoff, and are not prone to either

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Soil Series	Depth to Water Table	Location	Characteristics
			flooding or ponding
Urban	Unknown	Multiple areas	These areas consist of 75 percent or more of developed land uses such as streets, houses, commercial buildings, parking lots, shopping centers, industrial parks, or airports and related facilities

Source: Air Force, 2019d; U.S. Department of Agriculture (USDA), 1984; USDA NRCS, 2019.

TABLE 3.6-2A SOILS – 2000 AREA PROJECTS

Description	2000 Area (Acres)			
	2000-1a	2000-1b	2000-1c	Total
Beaches	5.7	6.5	0.0	12.2
Kureb sand, 0 to 5 percent slopes	0.4	0.1	0.0	0.5
Leon sand, 0 to 2 percent slopes	0.0	0.0	22.6	22.6
Mandarin sand, 0 to 2 percent slopes	0.0	0.0	8.6	8.6
Pottsburg-Pottsburg, wet, sand, 0 to 2 percent slopes	0.0	2.0	0.0	2.0
Resota fine sand, 0 to 5 percent slopes	0.0	0.0	14.8	14.8
Water	0.0	4.3	0.0	4.3
Grand Total	6.1	12.9	46.0	65.0

Source: USDA NRCS, 2019.

TABLE 3.6-2B SOILS – 8500 AREA PROJECTS

Description	8500 Area (acres)
	8500-1
Leon sand, 0 to 2 percent slopes	18.6
Mandarin sand, 0 to 2 percent slopes	13.2
Grand Total	31.8

Source: USDA NRCS, 2019.

TABLE 3.6-2C SOILS – 9700 AREA PROJECTS

Description	9700 Area (acres)		
	9700-1	9700-2	Total
Leon sand, 0 to 2 percent slopes	56.7	0.0	56.7
Mandarin sand, 0 to 2 percent slopes	21.9	0.0	21.9
Pamlico-Dorovan complex	3.9	0.0	3.9
Pottsburg-Pottsburg, wet, sand, 0 to 2 percent slopes	97.4	0.5	97.9
Rutlege sand, 0 to 2 percent slopes	2.0	0.0	2.0
Grand Total	181.9	0.5	182.4

Source: USDA NRCS, 2019.

TABLE 3.6-2D SOILS – FLIGHTLINE AREA PROJECTS

Description	Flightline Area (acres)										
	F-01	F-02	F-03	F-04	F-05	F-06	F-07	F-08	F-09	F-10	Total
Arents, 0 to 5 percent slopes	0.0	0.0	1.2	0.0	0.1	0.0	0.0	0.0	0.0	4.9	6.2
Urban land	5.4	1.4	11.9	1.3	1.7	2.6	1.6	3.1	2.7	0.0	31.7
Grand Total	5.4	1.4	13.1	1.3	1.8	2.6	1.6	3.1	2.7	4.9	37.9

Source: USDA NRCS, 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.6-2E SOILS – SILVER FLAG AREA PROJECTS

Description	Silver Flag Area (acres)
	SF-01
Leon sand, 0 to 2 percent slopes	2.2
Pottsburg-Pottsburg, wet, sand, 0 to 2 percent slopes	1.2
Grand Total	3.4

Source: USDA NRCS, 2019.

TABLE 3.6-2F SOILS – SUPPORT AREA PROJECTS

Description	Support Area (acres)							
	SA-01, SA-02, SA-03	SA-04	SA-05, SA-09, SA-10	SA-06	SA-07	SA-08	SA-11	Total
Arents, 0 to 5 percent slopes	0.0	0.0	12.3	0.0	0.1	0.0	26.8	39.2
Hurricane sand, 0 to 2 percent slopes	0.0	4.1	5.0	0.0	0.0	2.7	14.7	26.5
Leon sand, 0 to 2 percent slopes	5.4	1.7	3.8	0.0	0.0	0.0	16.2	27.1
Mandarin sand, 0 to 2 percent slopes	38.8	0.0	14.1	30.8	3.3	0.0	9.4	96.4
Pamlico-Dorovan complex	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
Pottsburg-Pottsburg, wet, sand, 0 to 2 percent slopes	0.0	0.0	3.8	0.0	0.3	0.0	0.0	4.1
Resota fine sand, 0 to 5 percent slopes	0.0	0.0	9.6	0.0	0.6	0.0	0.0	10.2
Urban land	3.5	0.0	0.0	0.9	0.0	3.3	0.8	8.5
Grand Total	47.7	5.8	48.6	31.7	4.3	6.0	69.2	213.3

Source: USDA NRCS, 2019.

TABLE 3.6-2G SOILS – MULTI- AREA PROJECTS

Description	Multi-Area Projects (acres)		
	M-01	M-02	Total
Allanton sand	0.0	0.4	0.4
Arents, 0 to 5 percent slopes	186.0	17.4	203.4
Bayvi loamy sand	0.0	2.9	2.9
Beaches	0.0	1.9	1.9
Chipley sand, 0 to 5 percent slopes	0.0	3.8	3.8
Fripp-Corolla complex, 2 to 30 percent slopes	0.0	9.4	9.4
Hurricane sand, 0 to 2 percent slopes	0.0	8.6	8.6
Kureb sand, 0 to 5 percent slopes	0.0	0.4	0.4
Leon sand, 0 to 2 percent slopes	0.0	83.6	83.6
Mandarin sand, 0 to 2 percent slopes	0.0	94.9	94.9
Osier fine sand	0.0	47.7	47.7
Pamlico-Dorovan complex	0.3	3.5	3.8
Pickney fine sand	0.0	1.1	1.1
Pottsburg-Pottsburg, wet, sand, 0 to 2 percent slopes	0.7	69.1	69.8
Resota fine sand, 0 to 5 percent slopes	0.0	19.2	19.2
Rutlege sand, 0 to 2 percent slopes	0.7	58.0	58.7
Urban land	0.0	19.8	19.8
Grand Total	187.7	441.7	629.4

Source: USDA NRCS, 2019

Note: Project M-03 (Building Demolition) not shown due to nature of project and low potential to disturb soils.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.7 WATER RESOURCES

Water resources include those waters that are above and below the surface of the Earth. Water resources for this EA include surface water, groundwater, floodplains (drainage basins), including waters of the U.S. (including wetlands), and coastal zone management. Surface and groundwater resources are protected by Federal and state laws and regulations, including the (CWA [Sections 401, 402, and 303(d)], the Safe Drinking Water Act, Section 438 of the Energy Independence and Security Act, and the USEPA's NPDES administered by the FDEP.

3.7.1 SURFACE WATER

Surface water is any body of water at land's surface and includes natural features such as wetlands, swamps, streams, rivers, ponds, lakes, marshes, bayous, and oceans. Man-made surface waters include impoundments, canals, drainage ditches, and storm water catchments (but are not necessarily considered waters of the U.S.). Tyndall AFB, within Bay County, Florida, is located in the St. Andrew Bay watershed in the Northwest Florida Water Management District ([NFWFMD], 2017). The St. Andrew Bay Watershed covers approximately 740,000 acres of the central Florida panhandle. This watershed is unique in that it contains no major rivers (NFWFMD, 2017). The St. Andrew Bay estuary system covers approximately 59,568 acres and is comprised of five bay and lagoon segments; St. Andrew Bay, East Bay, West Bay, North Bay, and Grand Lagoon. St. Andrew Bay lies to the northwest of Tyndall AFB and northeast of East Bay. Additionally, St. Andrew Sound lies to the south of Tyndall AFB and covers approximately 4,707 acres. Compared to watershed systems that contain major rivers, the estuarine waters of the St. Andrew Bay Watershed are deeper, clearer, and are characterized by high and consistent salinity. There are several additional water features that are either connected to St. Andrew Sound or East Bay that are adjacent to Tyndall AFB and these include Wild Goose Lagoon, Blind Alligator Bayou, Strange Bayou, Fred Bayou, Pearl Bayou, Freshwater Bayou, Sheephead Bayou, and Smack Bayou. Tyndall AFB contains one natural lake, Felix Lake; although, it is located on the northern section of the base and not adjacent to any project area (Air Force, 2019d).

The following Federal regulations apply to Federal proposed actions that would impact surface waters:

Section 401 of the Clean Water Act - Section 401 of the CWA requires state certification of all Federal licenses and permits in which there is a "discharge of fill material into navigable waters." The certification process is used to determine whether an activity, as described in the Federal license or permit, would impact established site-specific water quality standards. A water quality certification from the issuing state, the FDEP in this case, is required prior to the issuance of the relevant Federal license or permit. The most common Federal license or permit requiring certification is the USACE CWA Section 404 Permit.

Section 402 of the Clean Water Act - The NPDES program was created by Section 402 of the CWA. This program authorizes the USEPA to issue permits for the point-source discharge of pollutants into waters of the U.S. The NPDES permitting program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Stormwater from construction sites that would result in a disturbance of one acre or more are regulated under the FDEP NPDES, Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

Section 404 of the Clean Water Act - The USACE, through its permit program, regulates the discharge of dredged or fill material into waters of the U.S., including wetlands, pursuant to Section 404 of the CWA. In addition, the USEPA has regulatory oversight of the USACE permit program, allowing the agency under Section 404(c) to veto USACE-issued permits where there are unacceptable environmental impacts. As defined in 33 CFR Section 328.3:

(a) The term waters of the U.S. means

- (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (2) All interstate waters including interstate wetlands;
- (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:
 - (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (ii) Which are used or could be used for industrial purpose by industries in interstate commerce;
- (4) All impoundments of waters otherwise defined as waters of the U.S. under the definition;
- (5) Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;
- (6) The territorial seas; and
- (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section.

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

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

swamps, marshes, bogs, and similar areas” (33 CFR Section 328.3[b]) (USEPA, 2019c; USACE, 2010), wetlands are discussed in more detail in the following section.

Section 303(d) of the CWA - Section 303(d) of the CWA requires states to develop a list of waters that do not meet established water quality standards and to develop corrective action plans for those waters on the list. Surface waters that do not meet established water quality standards are designated as being “impaired”. There are no stream reaches near any of the project area; however, two estuaries located adjacent to Tyndall AFB are listed on Florida’s 303(d) list: St. Andrew Bay and East Bay. Both of these estuaries are listed for high levels of total nitrogen; St. Andrew Bay is also listed for fecal coliform and East Bay is listed for bacteria in shellfish.

Section 10 of the River and Harbors Act of 1899 - Section 10 of the River and Harbors Act of 1899 regulates structures or work in or affecting navigable waters. Navigable waters under this statute are defined as “those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce” (33 U.S.C. Section 403). The USACE implements a permit program to evaluate impacts on navigable waters and their navigable capacity under Section 10 (jointly with Section 404 of the CWA when a discharge of fill material is also involved). Regulated structures include such objects as buoys, piers, docks, bulkheads, and jetties, while work includes dredging or filling activities.

EO 11990 – Protection of Wetlands - EO 11990 directs Federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands for federally funded projects. Federal Emergency Management Agency (FEMA) regulations for complying with EO 11990 are found at 44 CFR Section 9, Floodplain Management and Protection of Wetlands.

AFI 32-7064, Integrated Natural Resources Management - AFI 32-7064 directs that installations shall develop and maintain current inventories of wetlands in order to plan for long-term protection or mitigation.

3.7.2 GROUNDWATER

Groundwater is classically defined as subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated (i.e., the pore spaces in the subsurface materials are completely filled with water). It is part of the hydrologic cycle, originating as precipitation that infiltrates or seeps into the subsurface and then moves toward surface water bodies, where it discharges to complete the hydrologic cycle.

Tyndall AFB is located within the Floridan aquifer. The Floridan aquifer covers an area of approximately 64,000,000 acres (100,000 square-miles) and covers all of Florida in addition to southern Alabama, southeastern Georgia, and southern South Carolina; and it is one of the most productive aquifers in the world (U.S. Geological Survey, 2019). The Floridan aquifer lies approximately 250 to 350 feet below the surface (USFWS, 2015); however, this is not the primary source of potable water on Tyndall AFB. The primary source of potable water is Deer Point Lake Reservoir (NFWFMD, 2017); it is 5,000-acres in size and is located seven miles north of Panama City.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.7.3 WETLANDS

The 325th Civil Engineer Squadron/Environmental Element, Compliance (325 CES/CEIEC) has primary responsibility for wetland protection, including evaluation of potential wetland impacts by the Proposed Actions, at Tyndall AFB. The Tyndall AFB INRMP (Air Force, 2019d) includes guidance on the management and protection of wetlands at the Tyndall AFB.

3.7.3.1 Affected Environment

Wetland and other surface water delineation surveys were performed in accordance with the guidelines found within the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (USACE, 2010) and methodologies prescribed in Chapter 62-340, Florida Administrative Code (F.A.C.), “Delineation of the Landward Extent of Wetlands and Surface Waters”. Surveys were initially completed on October 1-3, 2019 and November 1-3, 2019 by Gulf South Research Corporation (GSRC). Additional surveys were completed on January 27-29, 2020 by AECOM and GSRC (Tyndall AFB, 2020). These surveys revealed 134.9 acres of wetland habitat. Other surface waters identified in the proposed project areas consist of 120,300 LF of drainage ditches and 15.8 acres of a stormwater management pond/open water/drainage features (**Figures 3.7-1a through 3.7-1p**). **Table 3.7-1** summarizes the acreage and type of all identified wetlands and other surface waters identified within the proposed project areas. Wetlands and other surface waters were classified according to the Florida Department of Transportation (FDOT) *Florida Land Use, Cover and Forms Classification System* (FLUCFCS), (FDOT, 1999) and USFWS’ *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979); A formal Jurisdictional Determination of the wetlands and other surface waters will be determined during the state and Federal permitting process.

Most of the wetlands (52 percent) occur in the 9700 Area. The majority of this area has been logged in the past and has revegetated with prairie vegetation.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.7-1 WETLAND AND OTHER SURFACE WATERS IDENTIFIED IN THE PROJECT AREAS

Project Category	Project	Wetland/OSW	FLUCFCS Description	USFWS Description	Acreage	Linear Feet
2000 Area Projects (Figures 3.7-1a and 3.7-1b)	2000-1a	WL 5	643 - Wet prairie	PEM1J – Palustrine, emergent, persistent, intermittently flooded	1.8	-
		OSW	540 – Bays and estuaries	E1UBL – Estuarine, subtidal, unconsolidated bottom, subtidal	0.1	-
	2000-1b	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	124
		OSW	540 – Bays and estuaries	E1UBL – Estuarine, subtidal, unconsolidated bottom, subtidal	3.6	-
		WL 6	630 – Wetland forested mixed	PFO3J – Palustrine, forested, broad-leaved evergreen, intermittently flooded	0.4	-
		WL 7	643 - Wet prairie	PEM1J – Palustrine, emergent, persistent, intermittently flooded	0.2	-
	2000-1c	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	1,615
		WL 8	643 - Wet prairie	PEM1J – Palustrine, emergent, persistent, intermittently flooded	1.4	-
	<i>Total - 2000 Area</i>					7.5
8500 Area Projects (Figure 3.7-1c)	8500-1	WL 4	631 – Wetland scrub	PSS3C – Palustrine, scrub-shrub, broad-leaved evergreen, seasonally flooded	2.3	-
		OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	664
<i>Total – 8500 Area</i>					2.3	664
9700 Area Projects (Figure 3.7-1d)	9700-1	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	7,501
		WL 1	643 – Wet prairie	PEM1E – Palustrine, emergent, persistent, seasonally flooded/saturated	24.7	-
		WL 2	641 – Freshwater marsh	PEM1F – Palustrine, emergent, persistent, semi-permanently flooded	0.3	-
		WL 3	643 – Wet prairie	PEM1E – Palustrine, emergent, persistent, seasonally	45.7	-

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	Wetland/OSW	FLUCFCS Description	USFWS Description	Acreage	Linear Feet
				flooded/saturated		
<i>Total - 9700 Area</i>					70.7	7,501
Flightline Area Projects (Figure 3.7-1e and 3.7-1f)	F-03	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	1,177
	F-10	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	703
<i>Total – Flightline Area</i>					-	1,880
Silver Flag Area Projects (3.7-1g)	SF-01	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	634
Support Area Projects (Figure 3.7-1h)	SA-01, SA-02, SA-03	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	1.2	2,501
	SA-05, SA-09, SA-10	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	59
	SA-06	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	1,806
			534 - Reservoir	POW – Palustrine, open water	0.1	-
		WL 9	641 – Freshwater marsh	PEM1C – Palustrine, emergent, persistent, seasonally flooded	0.2	-
	SA-07	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	<0.1	59
	SA-11	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	-	132
WL 14			631 – Wetland scrub	PSS3E – Palustrine, scrub-shrub, broad-leaved evergreen, seasonally flooded/saturated	0.8	-
<i>Total - Support Area</i>					2.3	4,557
Multi-Area Projects (Figures 3.7-1i through 3.7-1p)	M-01	OSW	510 – Streams and waterways	PEM – Palustrine, emergent, persistent	0.7	4,541
		WL 12	641 – Freshwater marsh	PEM1C – Palustrine, emergent, persistent, seasonally flooded	0.1	-
	M-02	OSW	510 – Streams and waterways/534 - Reservoir	PEM – Palustrine, emergent, persistent/POW – Palustrine, open water	10.1	98,784

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	Wetland/OSW	FLUCFCS Description	USFWS Description	Acreage	Linear Feet
		WL 10	641 – Freshwater marsh	PEM1C – Palustrine, emergent, persistent, seasonally flooded	0.3	-
		WL 11	640 – Vegetated non-forested wetlands	PEM1F – Palustrine, emergent, persistent, semi-permanently flooded	0.2	-
		WL 13	631 – Wetland scrub	PSS3D – Palustrine, scrub-shrub, broad-leaved evergreen, continuously saturated	0.1	-
		WL 15	646 – Treeless hydric savannah	PSS3D – Palustrine, scrub-shrub, broad-leaved evergreen, continuously saturated	3.5	-
		WL 16	643 – Wet prairie	PEM1K – Palustrine, emergent, persistent, artificially flooded	1.1	-
		WL 17	640 – Vegetated non-forested wetlands	PEM1C – Palustrine, emergent, persistent, seasonally flooded	0.9	-
		WL 18	640 – Vegetated non-forested wetlands	PEM1C – Palustrine, emergent, persistent, seasonally flooded	4.4	-
		WL 19a	642 – Saltwater marsh	E2EM1N – Estuarine, intertidal, emergent, persistent, regularly flooded	0.6	-
		WL 19b	642 – Saltwater marsh	E2EM1N – Estuarine, intertidal, emergent, persistent, regularly flooded	3.8	-
		WL 19c	642 – Saltwater marsh	E2EM1N – Estuarine, intertidal, emergent, persistent, regularly flooded	0.6	-
		WL 19d	626 – Hydric tree savanna	PFO4K – Palustrine, forested, needle-leaved evergreen, artificially flooded	5.9	-
		WL 19e	631 – Wetland scrub	PFO3J – Palustrine, forested, broad-leaved evergreen, intermittently flooded	0.5	-
		WL 19f	642 – Saltwater marsh	E2EM1N – Estuarine, intertidal, emergent, persistent, regularly flooded	26.0	-
		WL 19g	630 – Wetland forested mixed	PFO7E – Palustrine, forested, evergreen, seasonally flooded/saturated	6.2	-

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	Wetland/OSW	FLUCFCS Description	USFWS Description	Acreage	Linear Feet
		WL 20	640 – Vegetated non-forested wetlands	PEM1C – Palustrine, emergent, persistent, seasonally flooded	0.7	-
		WL 21	631 – Wetland scrub	PSS3C – Palustrine, scrub-shrub, broad-leaved evergreen, seasonally flooded	2.0	-
		WL 22	640 – Vegetated non-forested wetlands	PEM1C – Palustrine, emergent, persistent, seasonally flooded	0.2	-
<i>Total - Multi-Area</i>					<i>67.9</i>	<i>103,325</i>
Grand Total					150.7	120,300

Source: Based on field surveys performed by GSRC October and November 2019 and AECOM/GSRC January 2020.

Notes: OSW = Other Surface Water; WL = Wetland

LEGEND

-  Project Area
-  Wetlands
-  Other Surface Waters
-  Other Surface Waters


NORTH

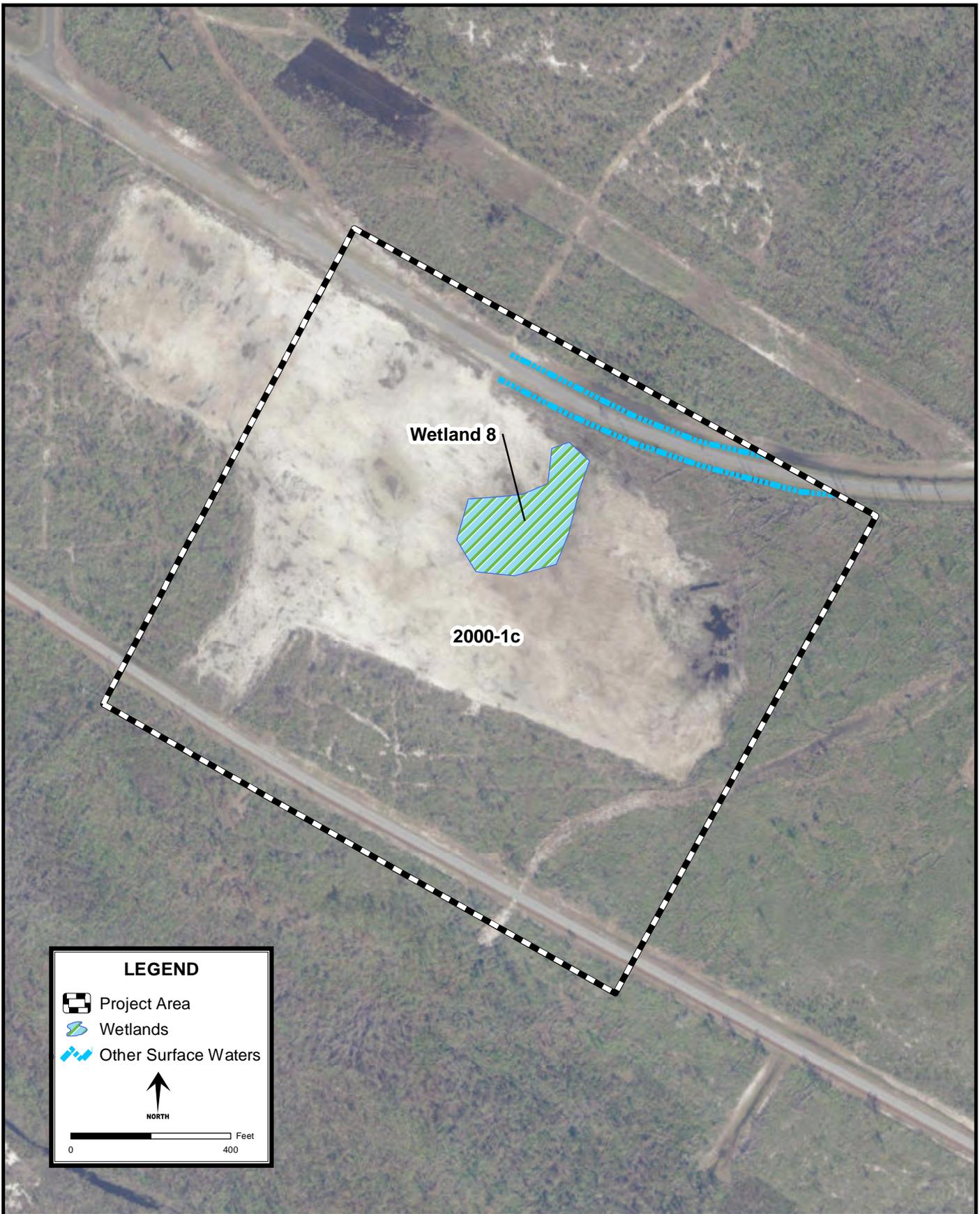
 Feet
0 300



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
2000 Area (Marina)**

**Figure
3.7-1a**



LEGEND

-  Project Area
-  Wetlands
-  Other Surface Waters


NORTH

 Feet
0 400



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
2000 Area (Ballfields)**

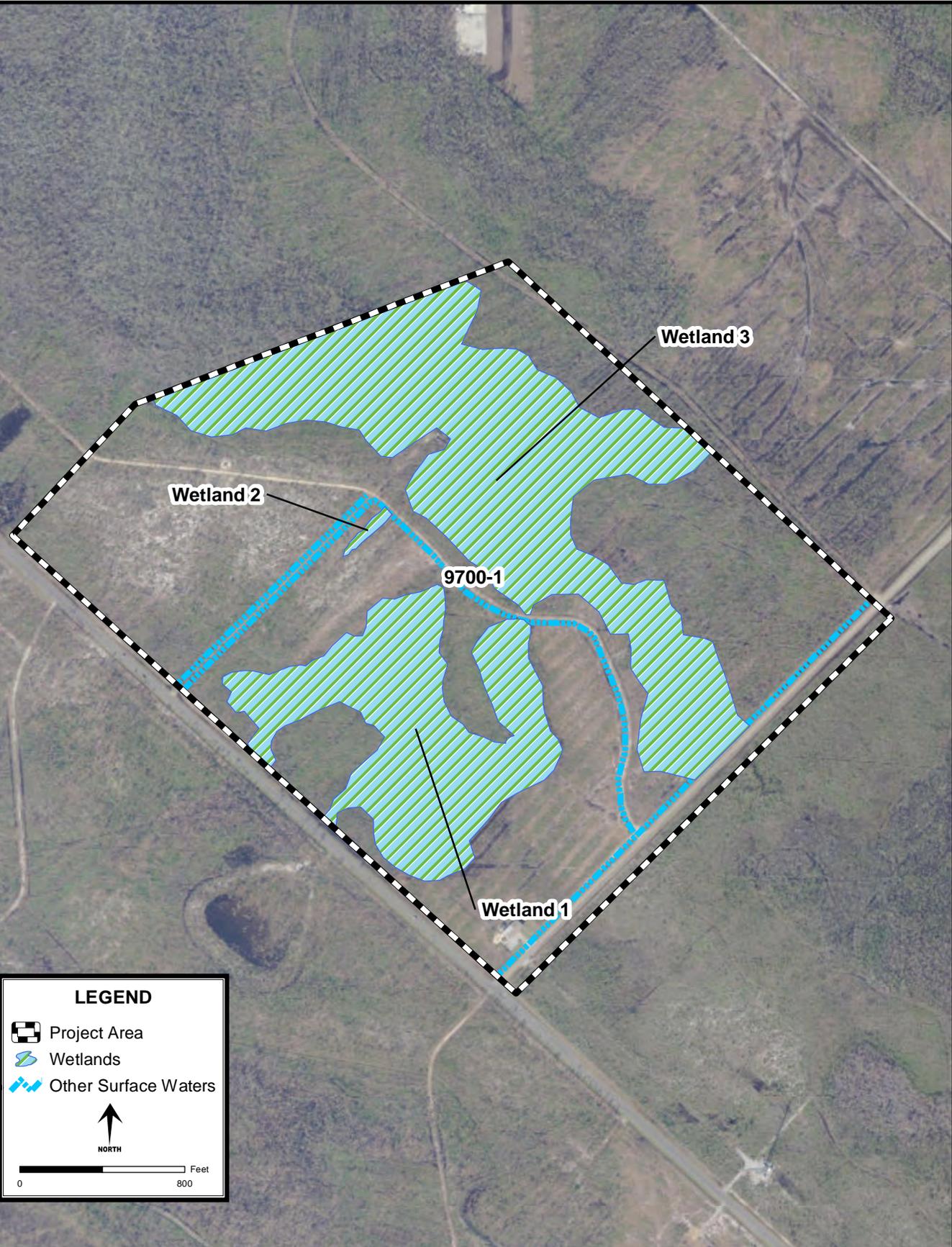
**Figure
3.7-1b**



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
8500 Area**

**Figure
3.7-1c**



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
9700 Area**

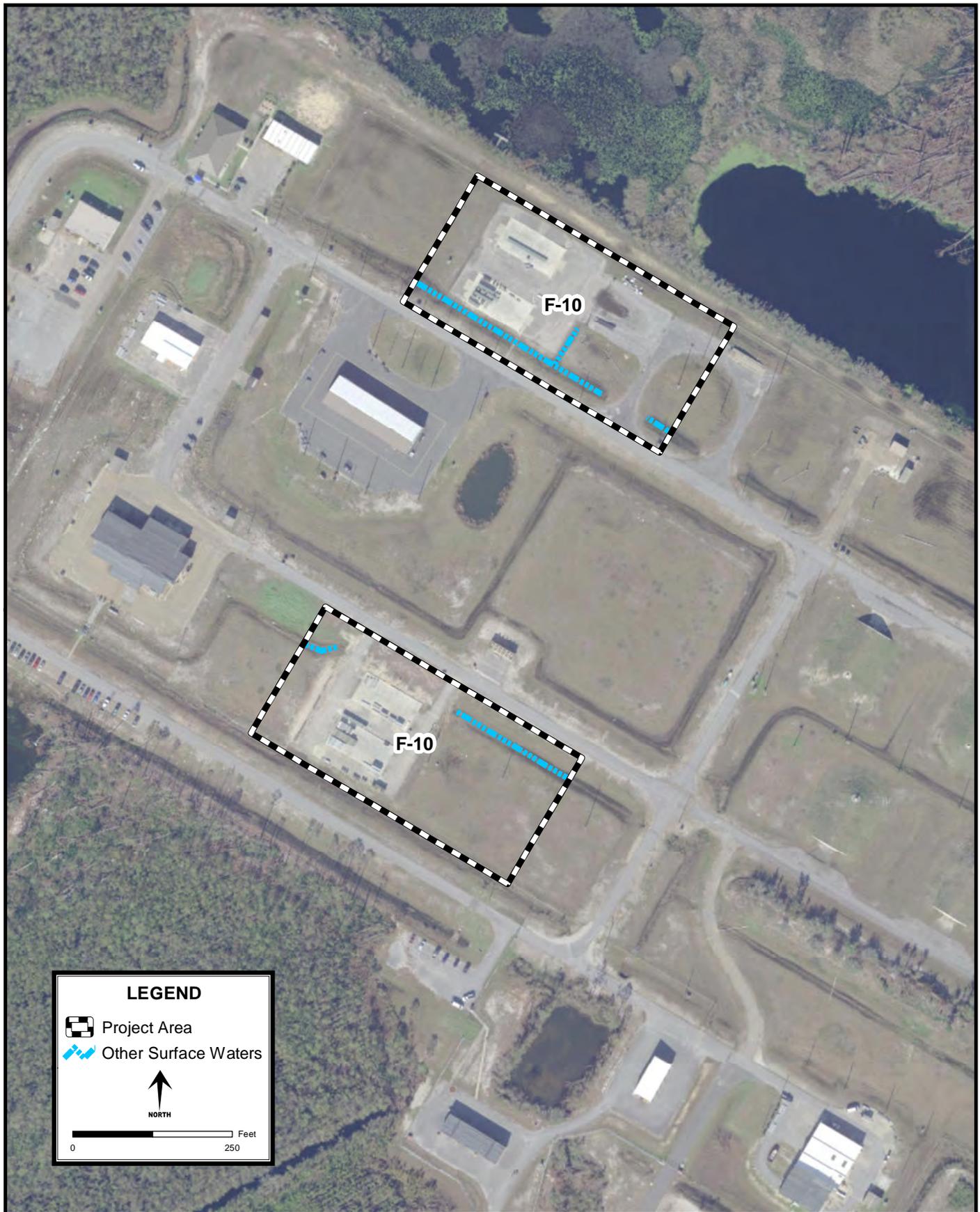
**Figure
3.7-1d**



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
Flightline Area**

**Figure
3.7-1e**



LEGEND

-  Project Area
-  Other Surface Waters


NORTH


0 250 Feet

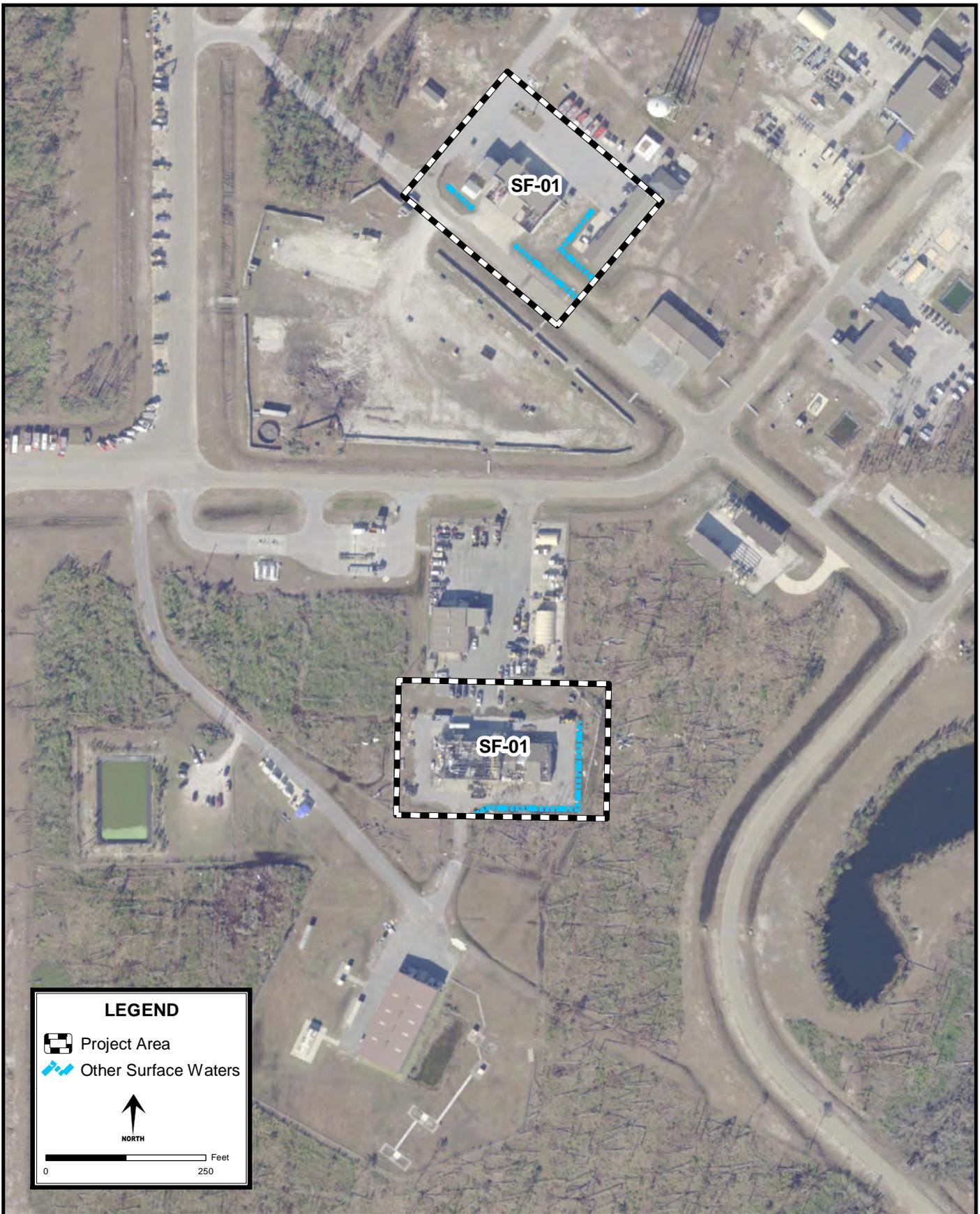


Tyndall Air Force Base, Panama City, FL

**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
Flightline Area
(MSA Facilities)**

**Figure
3.7-1f**



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
Silver Flag Area**

**Figure
3.7-1g**



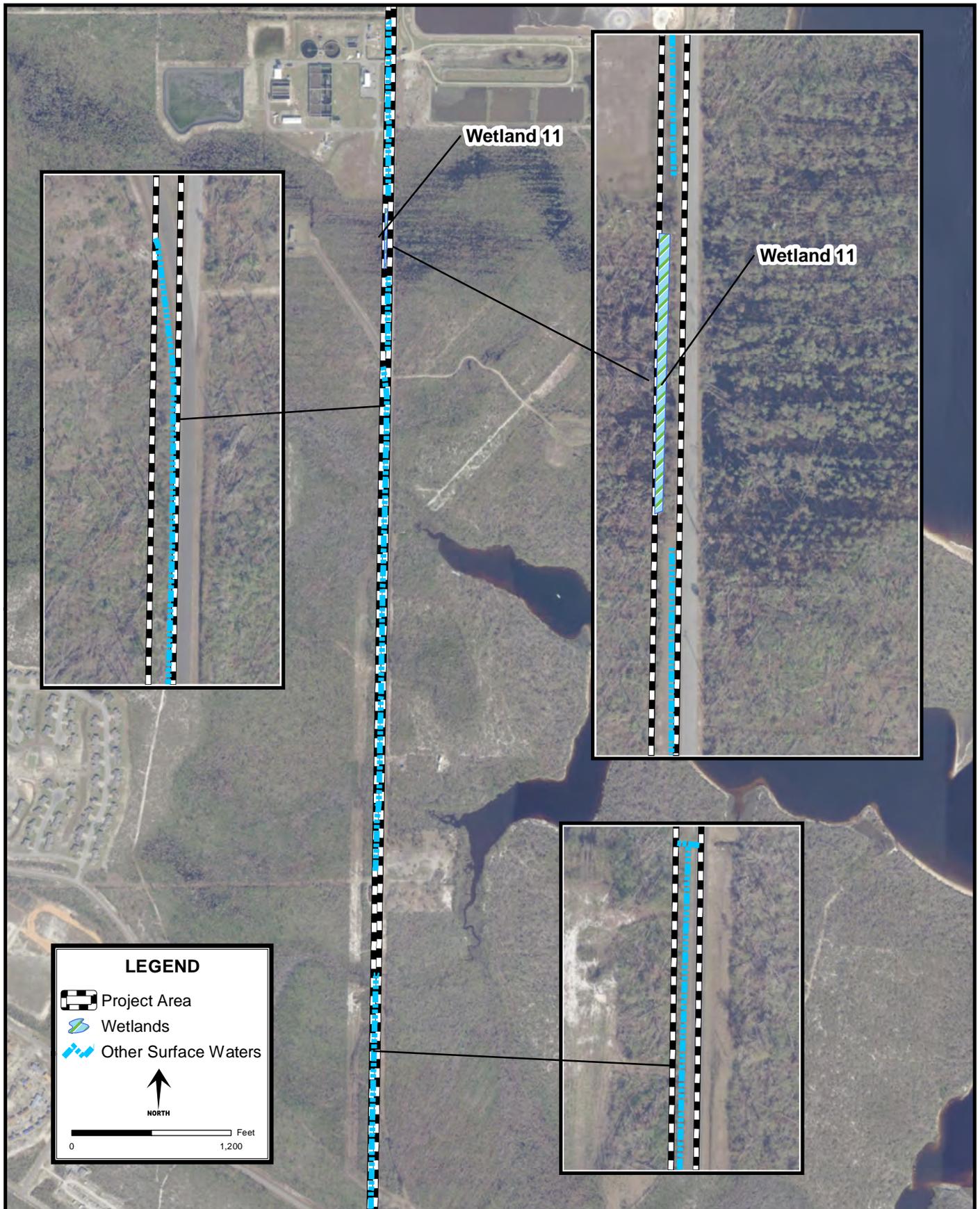
Wetlands and Other Surface Waters Support Area

Figure
3.7-1h



Wetlands and Other Surface Waters Multi-Area Projects (Airfield Drainage)

Figure
3.7-1i

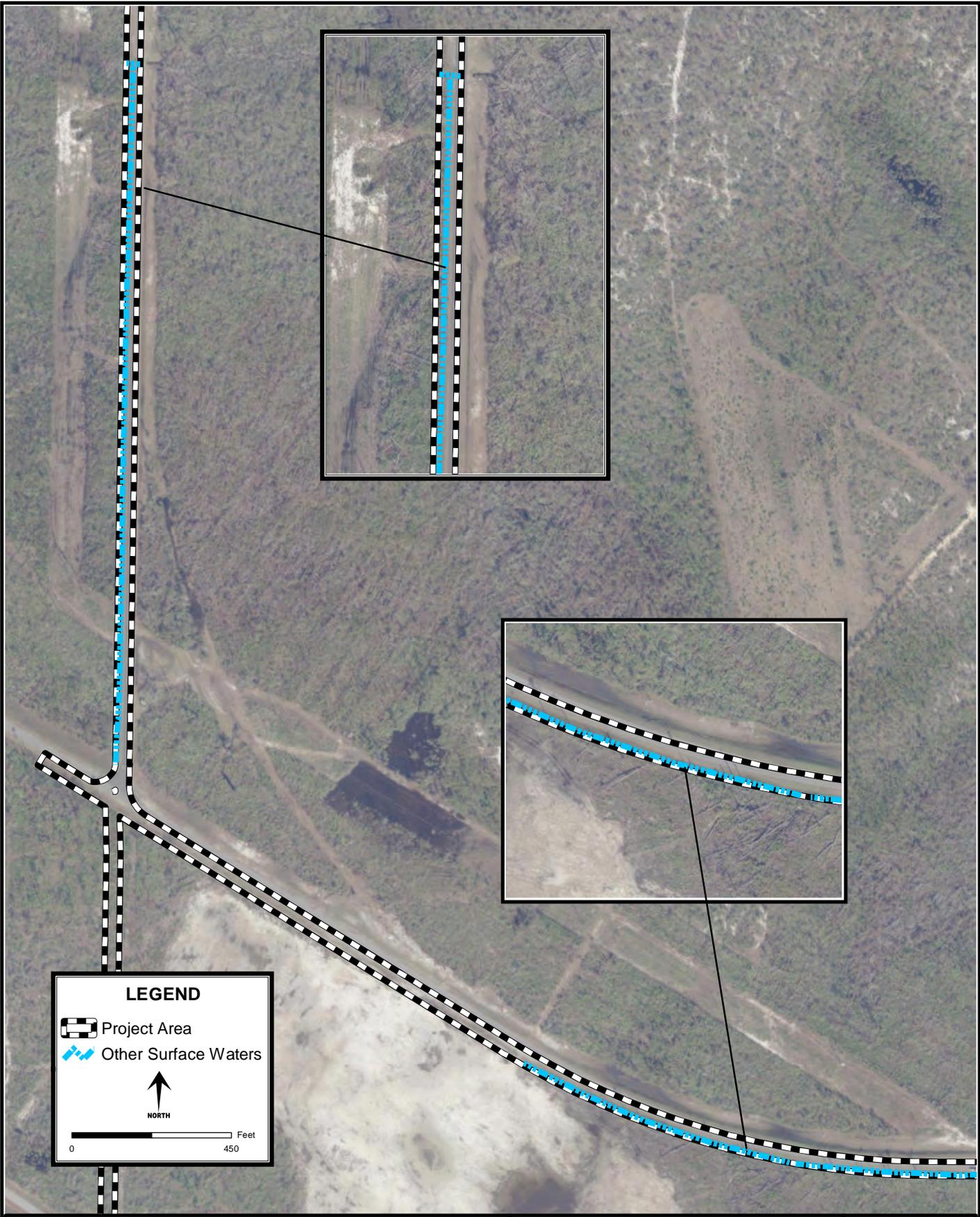


Tyndall Air Force Base, Panama City, FL

**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
Multi-Area Projects
(Utility Corridor)**

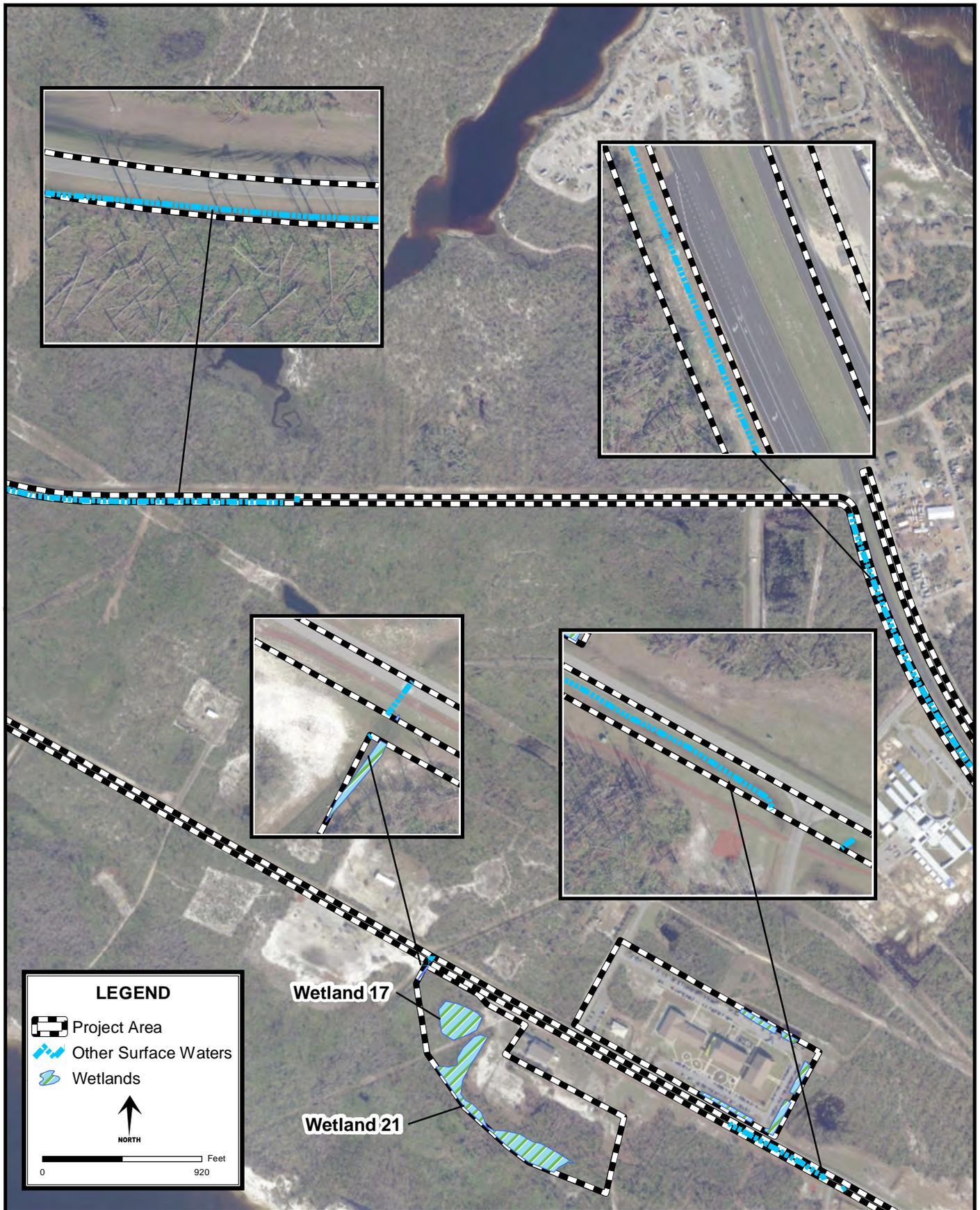
**Figure
3.7-1j**



Tyndall Air Force Base, Panama City, FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT

**Wetlands and
Other Surface Waters
Multi-Area Projects
(Utility Corridor)**

**Figure
3.7-1k**



LEGEND

- Project Area
- Other Surface Waters
- Wetlands

NORTH

0 920 Feet



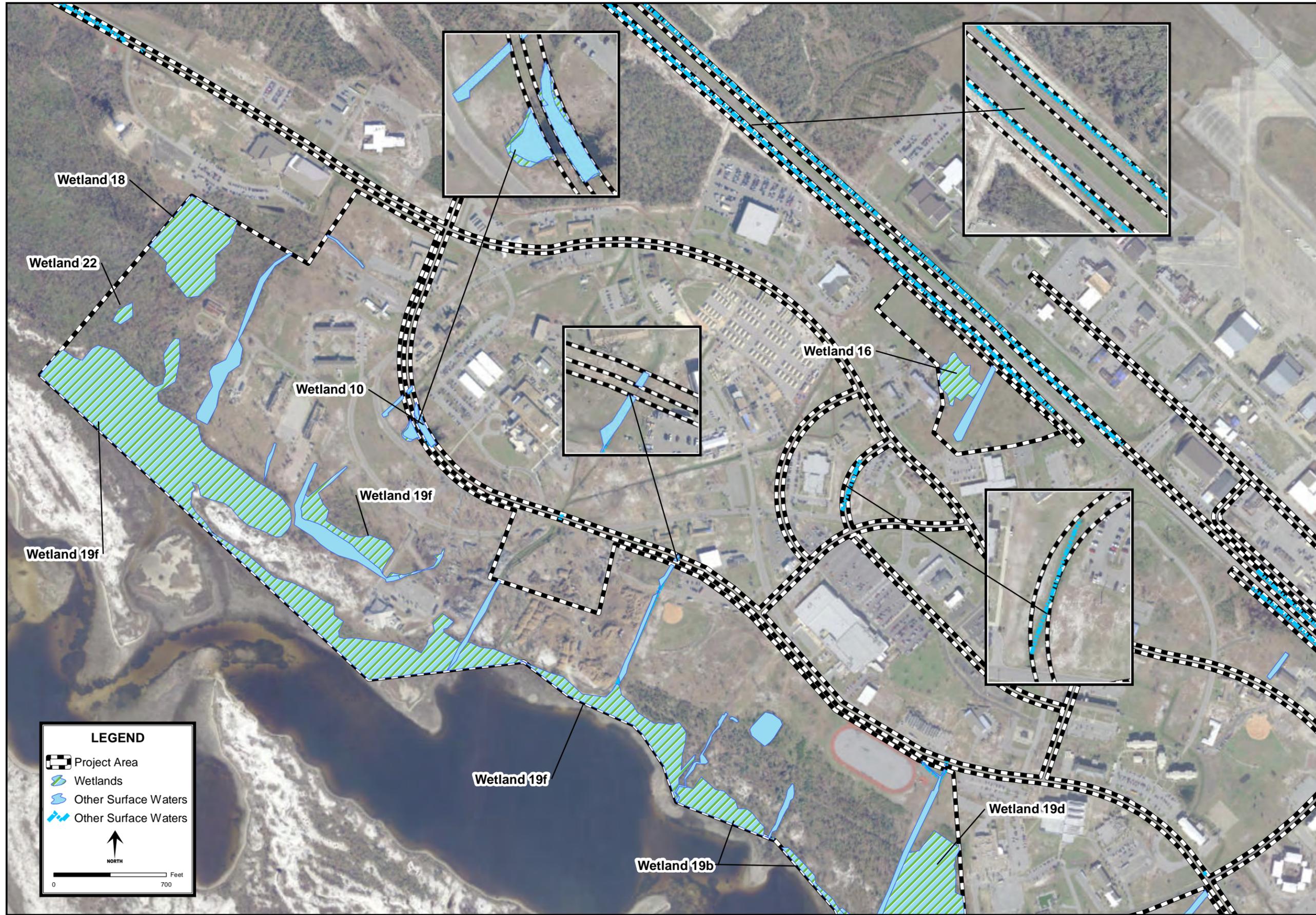
Tyndall Air Force Base, Panama City, FL

**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Wetlands and
Other Surface Waters
Multi-Area Projects
(Utility Corridor)**

**Figure
3.7-11**

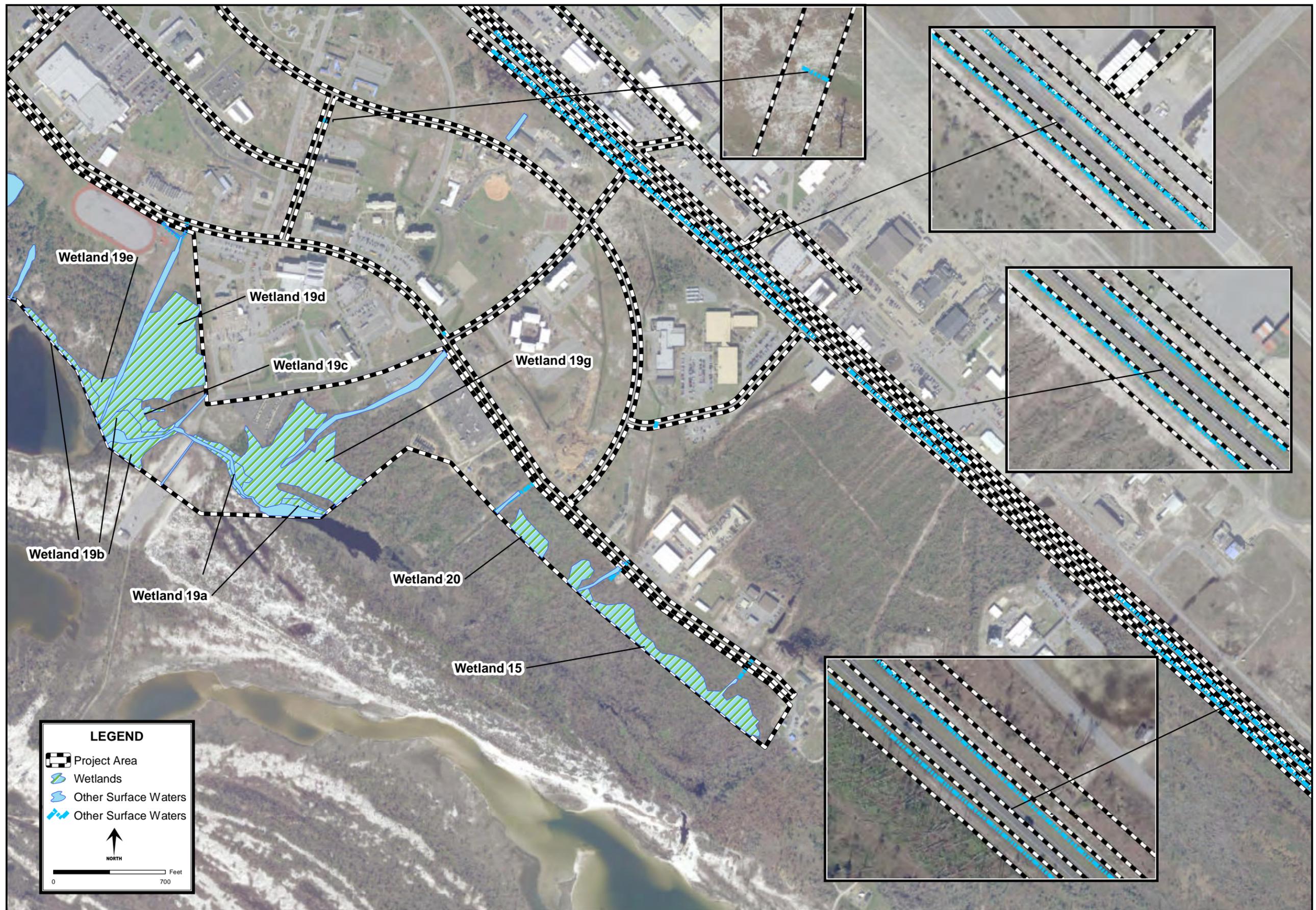
This page intentionally left blank.



Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor)

Figure
3.7-1m

Path: C:\Users\norman.norman\Desktop\TAFB\GIS\Revised Mar 2020\Figure 3.7-1n_Wetlands Multi-Area Utility.mxd, Date Saved: 3/9/2020 3:09:44 PM

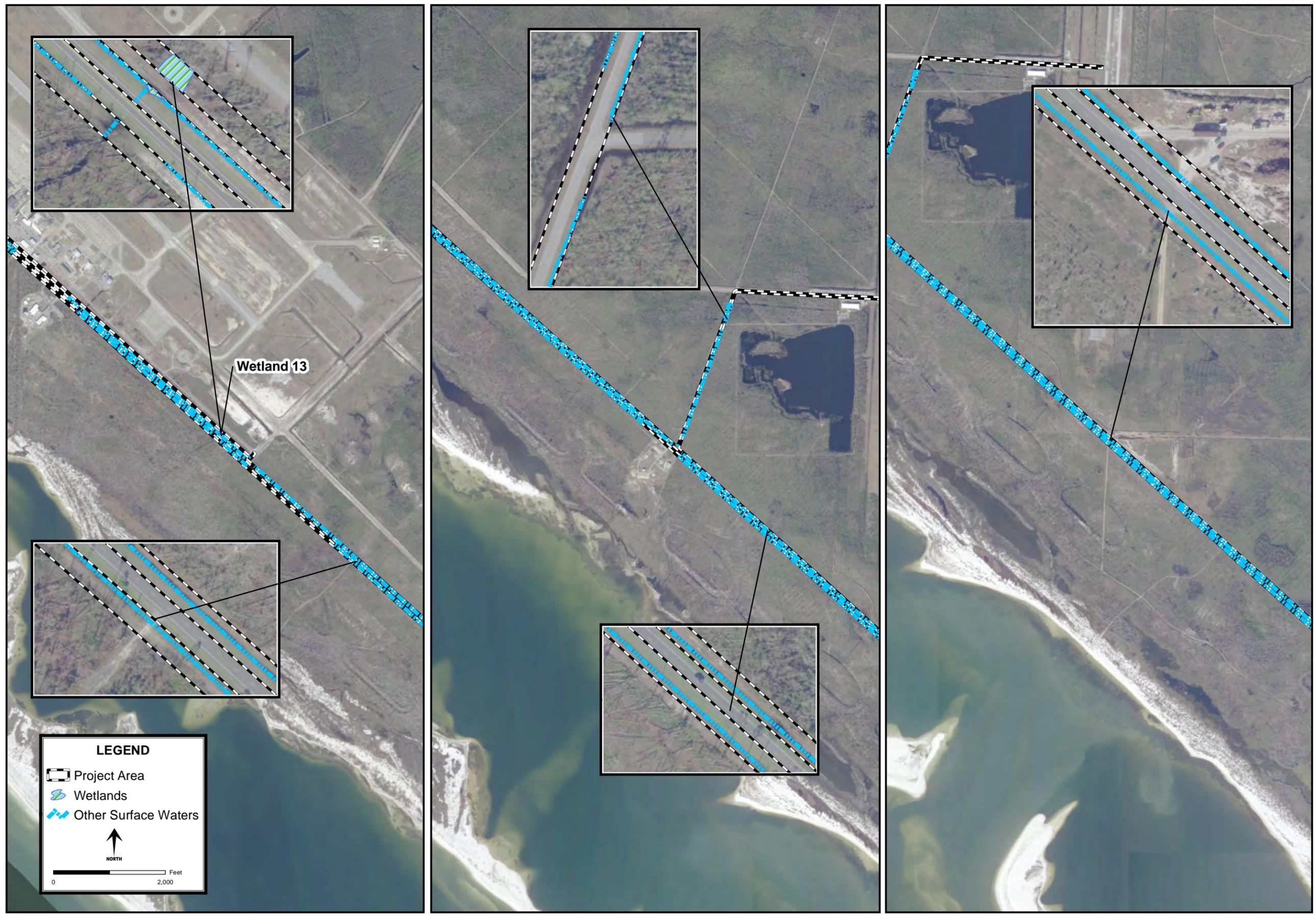


Tyndall Air Force Base, Panama City, FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



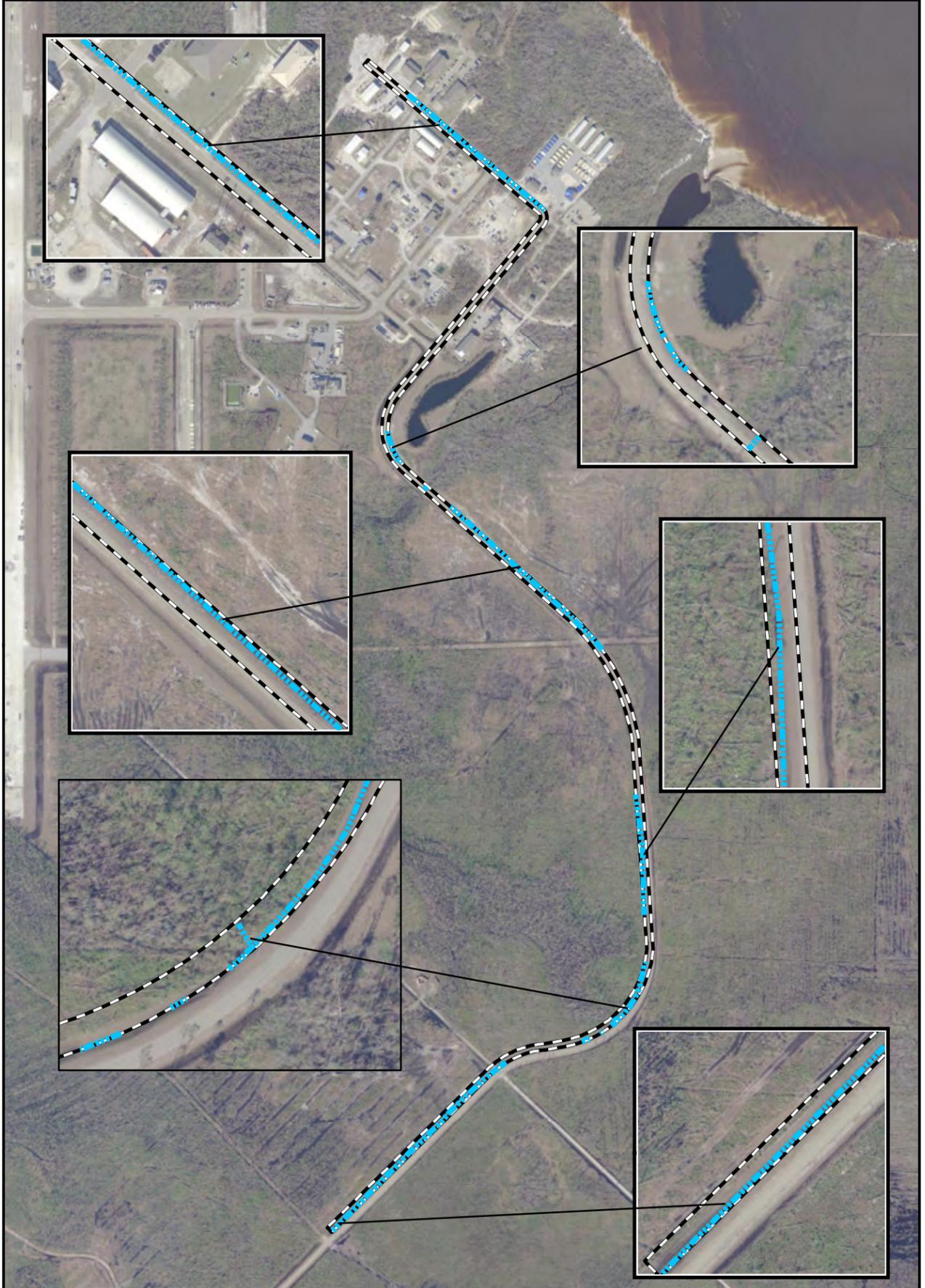
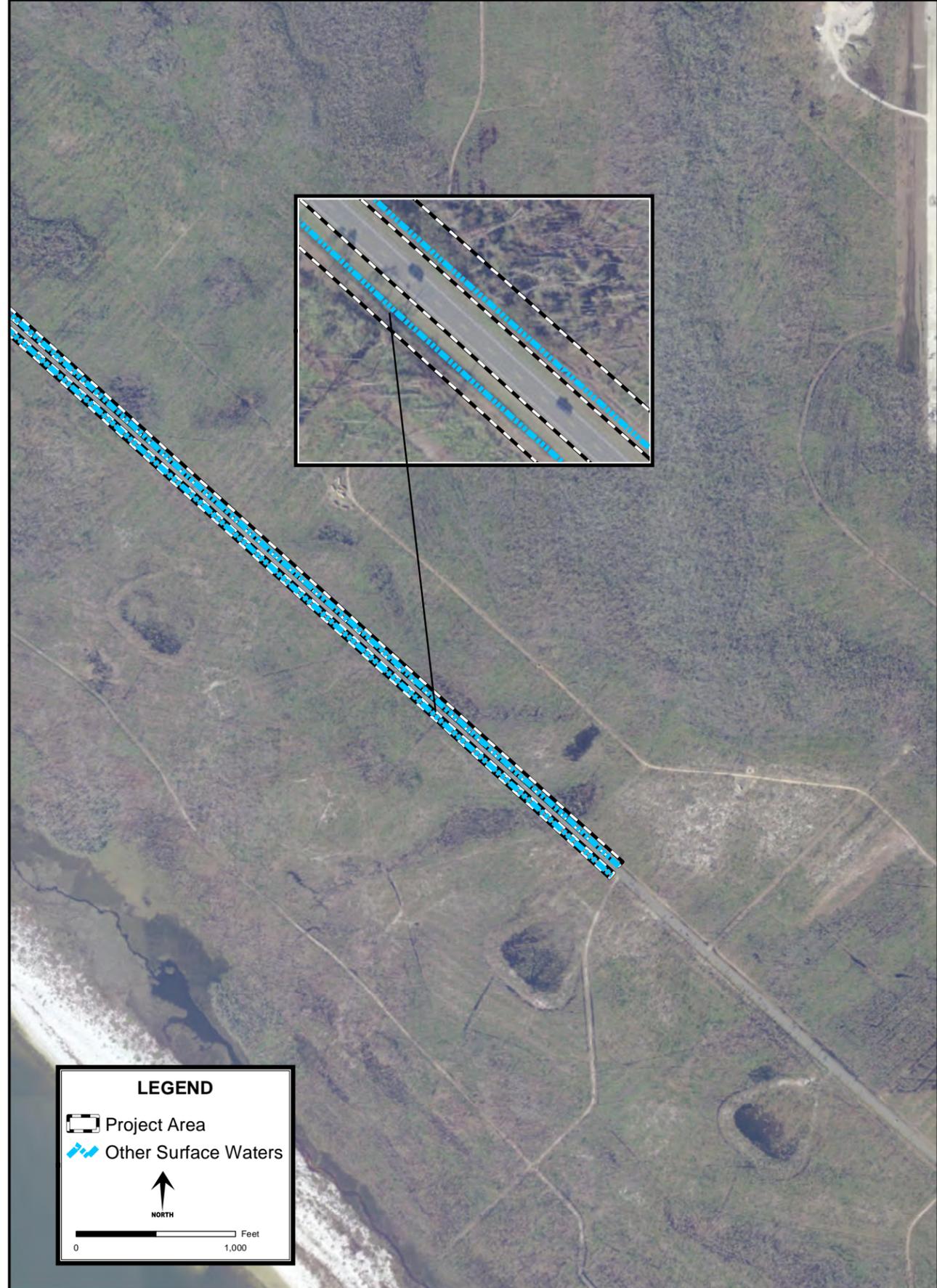
Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor)

Figure
3.7-1n



**Wetlands and Other Surface Waters
Multi-Area Projects (Utility Corridor)**

**Figure
3.7-10**



Tyndall Air Force Base, Panama City, FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



Wetlands and Other Surface Waters Multi-Area Projects (Utility Corridor)

Figure
3.7-1p

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.7.4 FLOODPLAINS

Floodplains are lands bordering rivers and streams that are typically dry but covered with water during floods. They occur in both inland and coastal areas. Risk of flooding is typically related to local topography, the frequency of precipitation events, size of the watershed above the floodplain, and in the case of coastal areas, storm surge intensity. The direct function of a floodplain is to absorb water and energy from storms. Indirect benefits are groundwater recharge from stormwater absorption, nutrient cycling, waste disposal, carbon sequestration, wildlife habitat, vegetative diversity, and aesthetic qualities.

FEMA categorizes floodplains into several categories based on their chance of flooding in any given year. The location and extents of floodplain areas with the proposed project areas are shown in **Figures 3.7-2a through 3.7-2h** and summarized in **Table 3.7-2**.

TABLE 3.7-2 FLOODPLAINS IDENTIFIED IN THE PROJECT AREAS

Project Category	Project	Acreage			
		Zone A	Zone AE	Zone VE	Total
2000 Area Projects (Figures 3.7-2a and 3.7-2b)	2000-1a	0.0	2.8	0.0	2.8
	2000-1b	0.0	6.5	4.9	11.4
	2000-1c	4.0	0.0	0.0	4.0
<i>Total – 2000 Area</i>		4.0	9.3	4.9	18.2
8500 Area Projects (Figure 3.7-2c)	8500-1	0.1	0.0	0.0	0.1
9700 Area Projects (Figure 3.7-2d)	9700-1	29.6	4.7	0.0	34.3
Flightline Area Projects (Figure 3.7-2e)	F-10	0.0	0.9	0.0	0.9
Support Area Projects (Figure 3.7-2f)	SA-01/SA-02/SA-03	0.1	0.0	0.0	0.1
	SA-11	5.8	0.0	0.0	5.8
<i>Total – Support Area</i>		5.9	0.0	0.0	5.9
Multi-Area Projects (Figures 3.7-2g and 3.7-2h)	M-01	0.3	2.2	0.0	2.5
	M-02	33.7	31.3	0.0	65.0
<i>Total – Multi Area</i>		34.0	33.5	0.0	67.5
Grand Total		73.4	48.4	4.9	126.9

Source: FEMA, 2019.

Notes: Zone A and AE – one percent annual chance of flooding; 100-year floodplain; Zone VE – one percent chance of flooding with additional hazards due to storm-induced velocity wave action; 100-year floodplain with additional hazards

The following Federal regulations apply to Federal proposed actions that would impact floodplains:

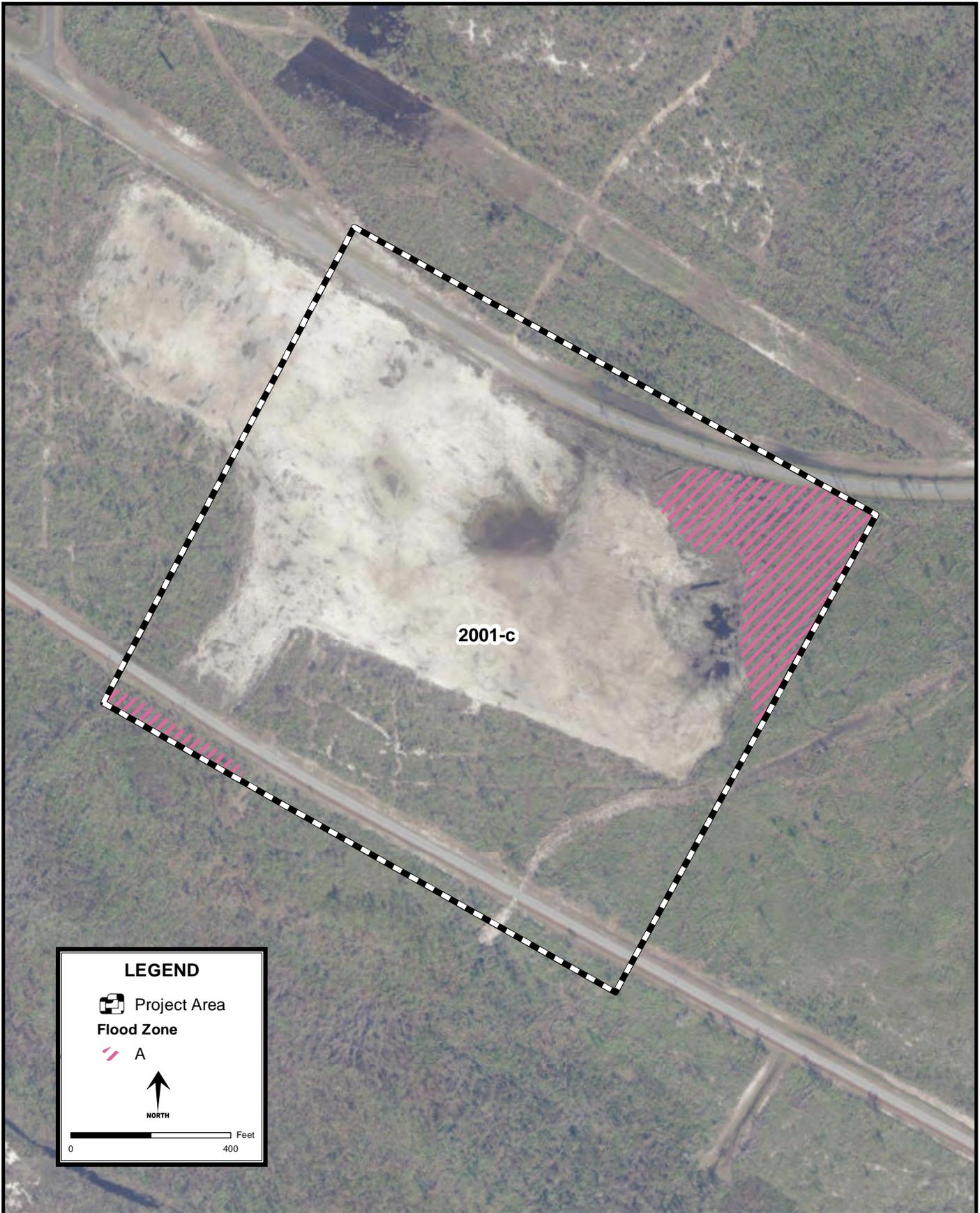
EO 11988, Floodplain Management - EO 11988 requires Federal agencies to avoid direct or indirect support or development within or affecting the one percent annual chance Special Flood Hazard Area (SFHA) (i.e., the 100-year floodplain) whenever there is a practicable alternative for Critical Actions, within the 0.2 percent annual chance SFHA (i.e., the 500-year floodplain). EO 11988 further directs all Federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. FEMA’s regulations for complying with EO 11988 are found in 44 CFR Part 9.



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Floodplains
2000 Area (Marina)**

**Figure
3.7-2a**



LEGEND

 Project Area

Flood Zone

 A


NORTH

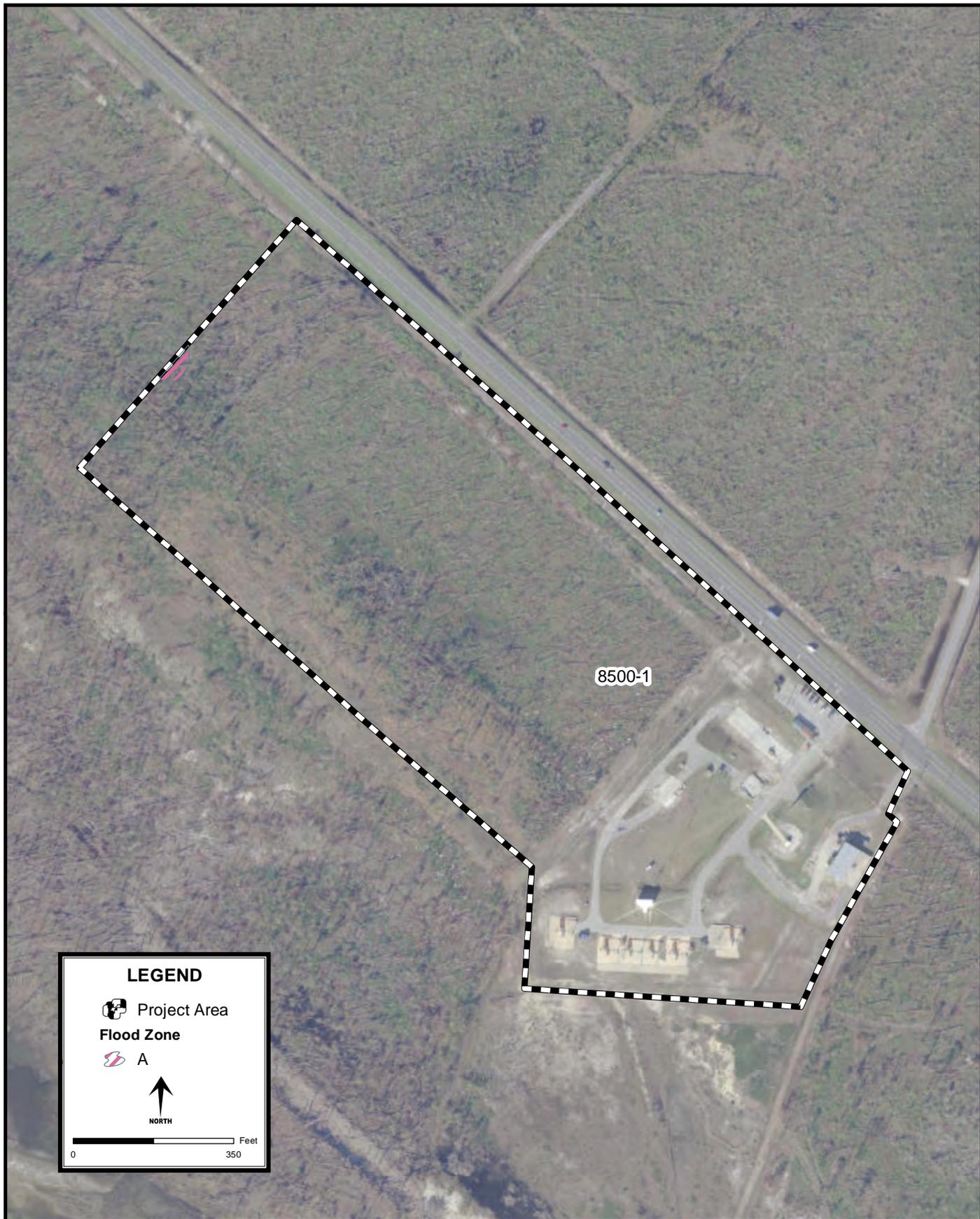

0 Feet 400



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Floodplains
2000 Area (Ballfields)**

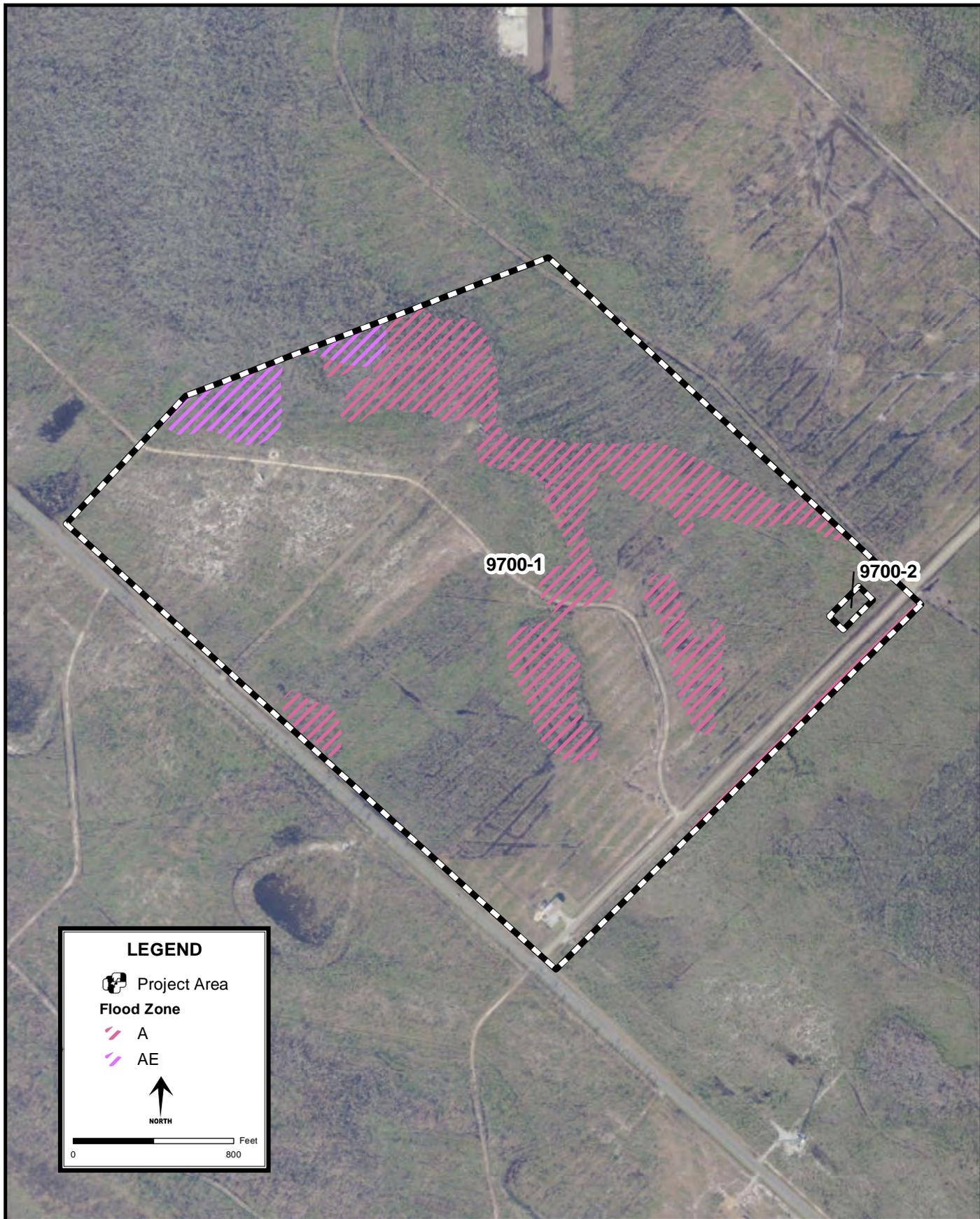
**Figure
3.7-2b**



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Floodplains
8500 Area**

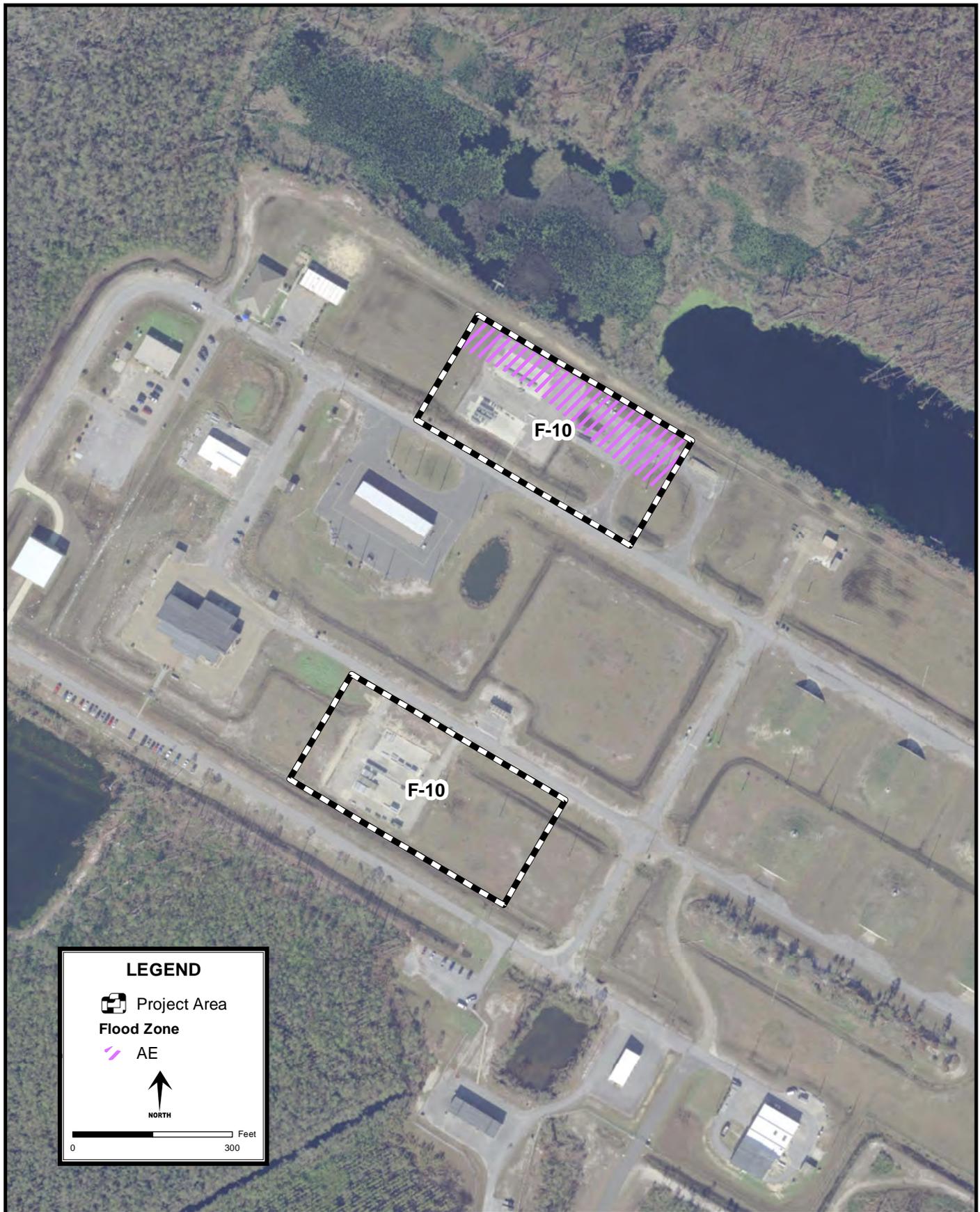
**Figure
3.7-2c**



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Floodplains
9700 Area**

**Figure
3.7-2d**



LEGEND

-  Project Area
- Flood Zone**
-  AE


NORTH

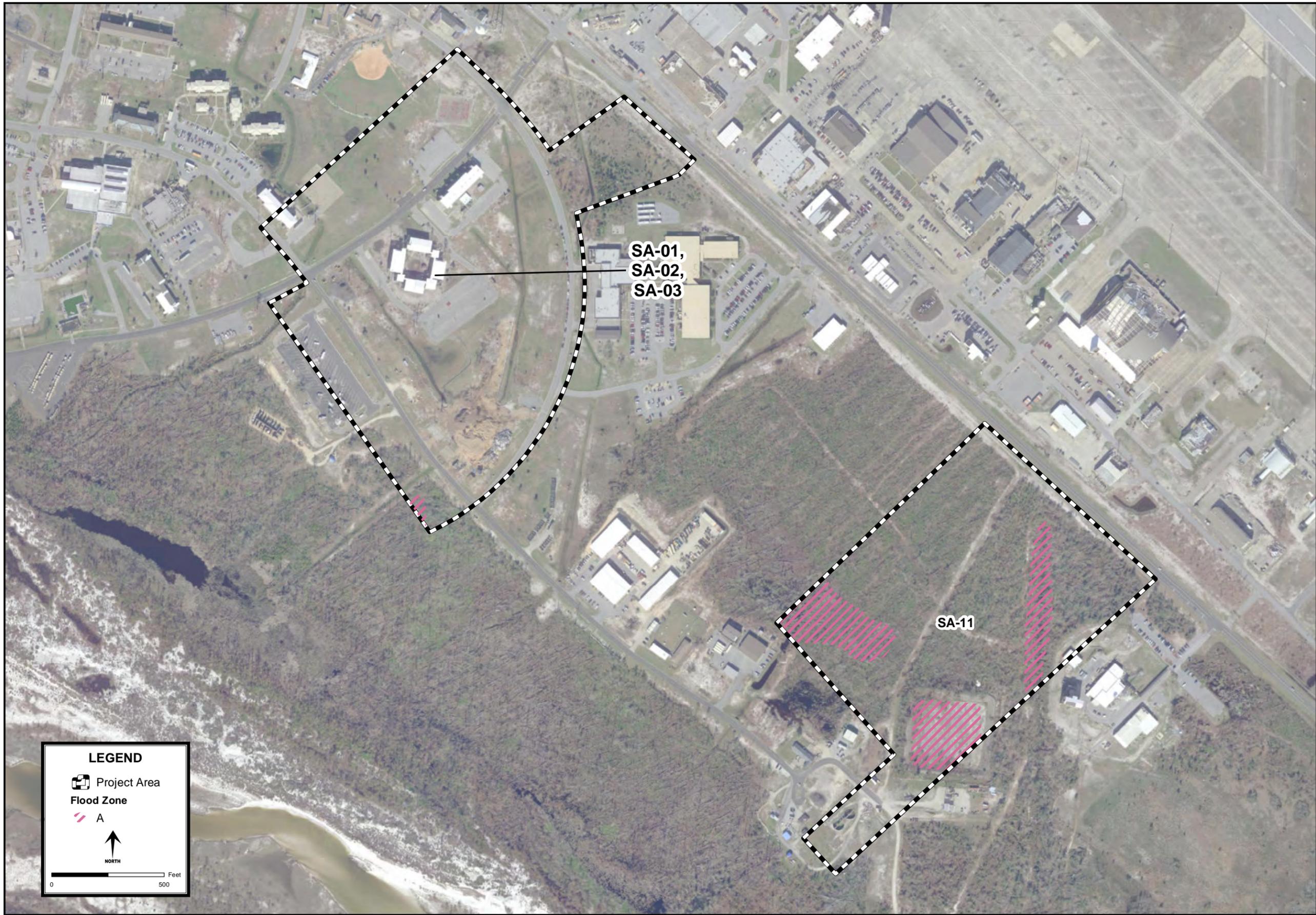

0 Feet 300



Tyndall Air Force Base, Panama City, FL
**ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT**

**Floodplains
Flightline Area**

**Figure
3.7-2e**



Tyndall Air Force Base, Panama City, FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



Floodplains Support Area

Figure
3.7-2f



LEGEND

- Project Area
- Flood Zone
 - A
 - AE

NORTH

0 1,150 Feet

Tyndall Air Force Base, Panama City, FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



**Floodplains
Multi-Area Projects (Airfield Drainage)**

**Figure
3.7-2g**



LEGEND

- Project Area
- Flood Zone**
- A
- AE

NORTH

0 1,500 Feet

Tyndall Air Force Base, Panama City, FL
ENVIRONMENTAL ASSESSMENT
FOR HURRICANE RECOVERY AND
INSTALLATION DEVELOPMENT



**Floodplains
Multi-Area Projects (Utility Corridor)**

**Figure
3.7-2h**

This Page Intentionally Left Blank

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.7.5 COASTAL ZONE MANAGEMENT

The coastal zone includes those coastal lands or water uses governed by the FDEP, pursuant to the Federal Coastal Zone Management Act (CZMA) (16 U.S.C. 1451 et seq., as amended). The FCMP implements these regulations within the state of Florida and encompasses the state's 67 counties and territorial seas. The outer boundary of Florida's coastal zone is the limit of state waters, which for the Atlantic Ocean coast of Florida is three nautical miles from shore and for the Gulf of Mexico coast of Florida is nine nautical miles from shore. The FCMP is administered by eight state agencies and five water management districts.

The CZMA was enacted to preserve, protect, develop, and, where possible, restore and enhance the resources of the Nation's coastal zone. Federal agency activities affecting a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state's coastal management program. The CZMA allows coastal states to develop a CZMP whereby it designates permissible land and water use within the state's coastal zone. The FCMP was approved by National Oceanic and Atmospheric Administration in 1981 and is codified in Chapter 380, Part II, F.S.. FCMP consists of a network of 24 Florida statutes administered by eight state agencies and five water management districts. Coordination of the program is managed by FDEP.

FDEP is given the authority by Congress to review certain Federal activities that have reasonably foreseeable effects on any land use, water use, or natural resources in its coastal zone to make sure that the Federal actions are consistent with the enforceable policies of Florida's federally approved FCMP. This authority is referred to as "Federal consistency." Some examples of "coastal land or water uses" include such activities as public access, recreation, fishing, historic or cultural preservation, development, energy infrastructure and use, hazards management, marinas, floodplain management, scenic and aesthetic enjoyment, and resource creation or restoration.

A CZMA review of Federal agency activities is conducted and proceeds with a submittal of either a Consistency Determination or a Negative Determination. As detailed in 15 CFR 930, state agencies, such as the FCMP, have 60 days from receipt of this document in which to concur with or object to a Consistency Determination, or to request an extension in writing. The Federal agency may presume state agency concurrence if the state agency's response is not received within 60 days from receipt of the Federal agency's Consistency Determination and supporting information. Tyndall AFB is located within the Florida Coastal Zone and is therefore required to submit a Federal Consistency Determination for the Proposed Action.

3.8 BIOLOGICAL RESOURCES

3.8.1 VEGETATION AND WILDLIFE

3.8.1.1 *Vegetation*

Tyndall AFB occurs within the Subtropical Division, Coastal Plain Mixed Forest Province, Section 232 (Bailey, 1995). This ecoregion is characterized by enduring mild winters and hot humid summers.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Precipitation occurs evenly throughout the year, but peaks slightly in correlation with thunderstorms occurring through the spring and midsummer months. The proposed project areas are at elevations ranging between approximately two and 78 feet above mean sea level.

All of the Proposed Action areas showed evidence of recent disturbance during October-November 2019 and January 2020 field reviews (Tyndall AFB, 2020). All land use/vegetative cover mapped within the proposed project areas were classified using FLUCFCS and were adapted from NFWFMD’s 2015-2016 Land Use GIS database (NFWFMD, 2018) and Tyndall AFB’s land use cover GIS data (Tyndall AFB, 2019a). Wetlands and other surface waters are further refined and identified in **Section 3.7.3. Tables 3.8-1a through 3.8-1g** summarizes the acreage of each land use/vegetative cover type mapped within the Proposed Action areas. Areas that were not classified using the FLUCFCS but were assessed via desktop analysis are developed areas that consist of paved surfaces and buildings. It should be noted that the acreages of the land use/vegetative cover types presented in **Tables 3.8-1a through 3.8-1g** do not reflect the delineated wetlands and other surface waters described in **Section 3.7.3**.

TABLE 3.8-1A LAND USE/VEGETATIVE COVER – 2000 AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	2000 Area (Acres)			
		2000-1a	2000-1b	2000-1c	Total
Developed Uplands					
1210	Fixed Single Family Units	-	0.2	-	0.2
1841	Marinas (Basins)	-	3.3	-	3.3
Unclassified Developed Area (Pavement and Structures)		-	1.4	6.0	7.4
<i>Subtotal Developed Uplands</i>		-	4.9	6.0	10.9
Undeveloped Uplands					
3100	Herbaceous (Dry Prairie)	-	0.2	1.1	1.3
3220	Coastal Scrub	4.6	1.0	-	5.6
3300	Mixed Rangeland	-	-	0.4	0.4
4210	Xeric Oak	-	-	0.7	0.7
4360	Upland Scrub, Pine and Hardwoods	-	-	37.2	37.2
4410	Coniferous Plantations, Slash Pine	-	-	0.2	0.2
<i>Subtotal Undeveloped Uplands</i>		4.6	1.2	39.6	45.4
Wetlands and Other Surface Waters					
5120	Stormwater conveyance	-	6.8	-	6.8
6270	Slash Pine Swamp Forest	-	-	0.5	0.5
6421	Cordgrass	1.4	-	-	1.4
6520	Shorelines	0.1	-	-	0.1
<i>Subtotal Wetlands and Other Surface Waters</i>		1.5	6.8	0.5	8.8
Grand Total		6.1	12.9	46.1	65.1

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.8-1B LAND USE/VEGETATIVE COVER – 8500 AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	8500 Area (acres)	
		8500-1	
Developed Uplands			
1430	Professional Services	8.5	
Unclassified Developed Area (Pavement and Structures)		1.4	
<i>Subtotal Developed Uplands</i>		9.9	
Undeveloped Uplands			
3100	Herbaceous (Dry Prairie)	2.9	
4410	Coniferous Plantations, Slash Pine	18.7	
<i>Subtotal Undeveloped Uplands</i>		21.6	
Wetlands and Other Surface Waters			
6110	Bay Swamps	0.1	
6270	Slash Pine Swamp Forest	0.2	
<i>Subtotal Wetlands and Other Surface Waters</i>		0.3	
Grand Total		31.8	

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

TABLE 3.8-1C LAND USE/VEGETATIVE COVER – 9700 AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	9700 Area (acres)		
		9700-1	9700-2	Total
Developed Uplands				
1754	Fire Stations	0.8	-	0.8
Unclassified Developed Area (Pavement and Structures)		2.2	-	2.2
<i>Subtotal Developed Uplands</i>		3.0	-	3.0
Undeveloped Uplands				
3100	Herbaceous (Dry Prairie)	2.6	-	2.6
4110	Pine Flatwoods	3.3	-	3.3
4120	Longleaf Pine - Xeric Oak	29.3	-	29.3
4410	Coniferous Plantations, Slash Pine	5.9	-	5.9
<i>Subtotal Undeveloped Uplands</i>		41.1	-	41.1
Wetlands and Other Surface Waters				
6110	Bay Swamps	5.6	-	5.6
6140	Titi Swamps	19.3	-	19.3
6250	Hydric Pine Flatwoods	1.1	-	1.1
6270	Slash Pine Swamp Forest	111.9	0.5	112.4
<i>Subtotal Wetlands and Other Surface Waters</i>		137.9	0.5	138.4
Grand Total		182.0	0.5	182.5

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.8-1D LAND USE/VEGETATIVE COVER – FLIGHTLINE AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	Flightline Area (acres)										
		F-01	F-02	F-03	F-04	F-05	F-06	F-07	F-08	F-09	F-10	Total
Developed Uplands												
8110	Airports	2.2	0.5	7.4	0.5	1.6	0.7	0.3	0.3	1.5	3.5	18.5
	Unclassified Developed Area (Pavement and Structures)	3.2	0.9	4.6	0.8	0.2	1.9	1.3	2.8	1.2	1.3	18.2
	<i>Subtotal Developed Uplands</i>	<i>5.4</i>	<i>1.4</i>	<i>12.0</i>	<i>1.3</i>	<i>1.8</i>	<i>2.6</i>	<i>1.6</i>	<i>3.1</i>	<i>2.7</i>	<i>4.8</i>	<i>36.7</i>
Undeveloped Uplands												
3100	Herbaceous (Dry Prairie)	-	-	1.1	-	-	-	-	-	-	-	1.1
	<i>Subtotal Undeveloped Uplands</i>	<i>-</i>	<i>-</i>	<i>1.1</i>	<i>-</i>	<i>1.1</i>						
Wetlands and Other Surface Waters												
5120	Stormwater conveyance	-	-	0.1	-	-	-	-	-	-	0.1	0.2
	<i>Subtotal Wetlands and Other Surface Waters</i>	<i>-</i>	<i>-</i>	<i>0.1</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>0.1</i>	<i>0.2</i>
	Grand Total	5.4	1.4	13.2	1.3	1.8	2.6	1.6	3.1	2.7	4.9	38.0

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

TABLE 3.8-1E LAND USE/VEGETATIVE COVER – SILVER FLAG AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	Silver Flag Area (acres)
		SF-01
Developed Uplands		
1731	Air Force Installation	1.7
	Unclassified Developed Area (Pavement and Structures)	1.4
	<i>Subtotal Developed Uplands</i>	<i>3.1</i>
Undeveloped Uplands		
3100	Herbaceous (Dry Prairie)	0.3
	<i>Subtotal Undeveloped Uplands</i>	<i>0.3</i>
	Grand Total	3.4

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.8-1F LAND USE/VEGETATIVE COVER – SUPPORT AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	Support Area (acres)							
		SA-01, SA-02, SA-03	SA-04	SA-05, SA-09, SA-10	SA-06	SA-07	SA-08	SA-11	Total
Developed Uplands									
7410	Rural land in transition without positive indicators of intended activity	-	-	-	-	-	-	0.2	0.2
8341	Treatment Plants	-	-	-	-	-	-	5.8	5.8
Unclassified Developed Area (Pavement and Structures)		12.0	1.9	22.9	8.5	1.4	3.6	6.6	56.9
<i>Subtotal Developed Uplands</i>		<i>12.0</i>	<i>1.9</i>	<i>22.9</i>	<i>8.5</i>	<i>1.4</i>	<i>3.6</i>	<i>12.6</i>	<i>62.9</i>
Undeveloped Uplands									
3100	Herbaceous (Dry Prairie)	34.3	3.9	25.4	23.0	2.9	2.4	18.2	110.1
4110	Pine Flatwoods	0.4	-	-	-	-	-	-	0.4
4140	Pine - Mesic Oak	-	-	-	-	-	-	13.0	13.0
4250	Temperate Hardwoods	0.5	-	-	-	-	-	-	0.5
4410	Coniferous Plantations, Slash Pine	-	-	-	-	-	-	21.5	21.5
<i>Subtotal Undeveloped Uplands</i>		<i>35.2</i>	<i>3.9</i>	<i>25.4</i>	<i>23.0</i>	<i>2.9</i>	<i>2.4</i>	<i>52.7</i>	<i>145.5</i>
Wetlands and Other Surface Waters									
5110	Natural Stream	-	-	-	-	-	-	1.6	1.6
5120	Stormwater conveyance	0.4	-	0.3	0.1	-	-	0.1	0.9
6140	Titi Swamps	-	-	-	-	-	-	0.4	0.4
6250	Hydric Pine Flatwoods	-	-	-	-	-	-	1.9	1.9
6270	Slash Pine Swamp Forest	0.1	-	-	-	-	-	-	0.1
<i>Subtotal Wetlands and Other Surface Waters</i>		<i>0.5</i>	<i>-</i>	<i>0.3</i>	<i>0.1</i>	<i>-</i>	<i>-</i>	<i>4.0</i>	<i>4.9</i>
Grand Total		47.7	5.8	48.6	31.6	4.3	6.0	69.3	213.3

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

TABLE 3.8-1G LAND USE/VEGETATIVE COVER – MULTI- AREA PROJECTS

FLUCFCS Code	FLUCFCS Description	Multi-Area Projects (acres)		
		M-01	M-02	Total
Developed Uplands				
1430	Professional Services	-	1.6	1.6
1731	Air Force Installation	-	1.1	1.1
1893	Skeet Ranges	-	1.4	1.4
8110	Airports	162.7	4.6	167.3
8143	Two-Lane Highways (State)	-	0.1	0.1
8330	Water Supply Plants	0.1	-	0.1
8341	Treatment Plants	-	1.4	1.4
Unclassified Developed Area (Pavement and Structures)		15.1	58.2	73.3
<i>Subtotal Developed Uplands</i>		<i>177.9</i>	<i>68.4</i>	<i>246.3</i>
Undeveloped Uplands				
3100	Herbaceous (Dry Prairie)	4.3	235.4	239.7

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

FLUCFCS Code	FLUCFCS Description	Multi-Area Projects (acres)		
		M-01	M-02	Total
3220	Coastal Scrub	-	4.9	4.9
4110	Pine Flatwoods	-	8.0	8.0
4120	Longleaf Pine - Xeric Oak	-	0.2	0.2
4140	Pine - Mesic Oak	-	1.7	1.7
4150	Mixed Pine	-	13.9	13.9
4210	Xeric Oak	-	0.1	0.1
4250	Temperate Hardwoods	-	5.4	5.4
4270	Live Oak	-	1.1	1.1
4360	Upland Scrub, Pine and Hardwoods	-	12.5	12.5
4410	Coniferous Plantations, Slash Pine	-	32.8	32.8
<i>Subtotal Undeveloped Uplands</i>		<i>4.3</i>	<i>316.0</i>	<i>320.3</i>
Wetlands and Other Surface Waters				
5120	Stormwater conveyance	4.9	6.8	11.7
5240	Lakes less than 10 acres (4 hectares) which are dominant features.	-	1.6	1.6
5340	Reservoirs less than 10 acres (4 hectares) which are dominant features	-	1.2	1.2
5420	Embayments not opening directly into the Gulf of Mexico or the Atlantic Ocean	0.1	2.6	2.7
6110	Bay Swamps	-	0.2	0.2
6140	Titi Swamps	-	0.5	0.5
6250	Hydric Pine Flatwoods	0.1	5.3	5.4
6260	Hydric Pine Savanna	-	1.0	1.0
6270	Slash Pine Swamp Forest	-	16.7	16.7
6410	Freshwater Marshes	-	0.1	0.1
6411	Sawgrass	-	1.5	1.5
6417	Freshwater Marsh with shrubs, brushes, and vines	0.6	-	0.6
6420	Saltwater Marshes	-	2.9	2.9
6421	Cordgrass	-	17.5	17.5
<i>Subtotal Wetlands and Other Surface Waters</i>		<i>5.7</i>	<i>57.9</i>	<i>63.6</i>
Grand Total		187.9	442.3	630.2

Source: FDOT, 1999; NFWFMD, 2018; Tyndall AFB, 2019a.

Within the 2000 Area project area, majority of the land use/vegetative cover consists of forested and herbaceous undeveloped uplands (70 percent). Approximately 17 percent of these areas consist of developed land use and 13 percent consists of wetlands/other surface waters. Dominant vegetative species present within the forested wetland areas include southern wax myrtle (*Morella cerifera*), bighead rush (*Juncus megacephalus*), large-leaf pennywort (*Hydrocotyle bonariensis*), erect-leaf witchgrass (*Panicum erectifolium*), bent spikerush (*Eleocharis geniculata*), starrush whitetop (*Dichromena colorata*), camphorweed (*Heterotheca subaxillaris*), bahiagrass (*Paspalum notatum*), carpetgrass (*Axonopus affinis*), and Carolina yelloweyed grass (*Xyris caroliniana*). Based on the field reviews, the majority of the forested upland areas are disturbed, clear-cut pine plantations predominantly consisting of bighead rush, common cattail (*Typha latifolia*), dwarf papyrus sedge (*Cyperus haspan*), Bentwan flatsedge (*Cyperus reflexus*), and coffeeweed (*Sesbania herbacea*).

Within the 8500 Area project area, approximately 68 percent of the land use/vegetative cover consists of mostly forested, undeveloped uplands followed by 31 percent developed land use and one percent forested wetlands. Based on the field reviews, the forested, upland areas consist mostly of clear-cut pine plantations predominantly consisting of bighead rush, gallberry (*Ilex glabra*), common persimmon

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

(*Diospyros virginiana*), shining sumac (*Rhus copallinum*), bloodroot (*Lachnanthes caroliniana*), broomsedge bluestem (*Andropogon virginicus*), savannah meadow beauty (*Rhexia alifanus*), justiceweed (*Eupatorium leucolepis*), slender goldentop (*Euthamia minor*), tapered rosette grass (*Dicanthelium acuminatum*), saw greenbrier (*Smilax bona-nox*), little bluestem (*Schizachyrium scoparium*), wand goldenrod (*Solidago stricta*), yellow nutsedge (*Cyperus esculentus*), mangrove flatsedge (*Cyperus ligularis*) and lowland rotala (*Rotala ramosior*).

The majority of the 9700 Area project area is comprised of forested wetlands (76 percent). Approximately 22 percent of the area is comprised of undeveloped uplands and two percent is developed land use. Based on the field reviews, the undeveloped uplands within this area have been previously disturbed and there was evidence of timber harvest activities within the forested uplands and wetlands. Dominant vegetative species within the pine plantation areas consist of slash pine, saw palmetto (*Serenoa repens*), southern wax myrtle, broomsedge bluestem, little bluestem, gallberry, bloodroot, justiceweed, bighead rush, coffeeweed, yaupon holly (*Ilex vomitoria*), bitter sneezeweed (*Helenium amarum*), dodder (*Cuscuta americana*), eastern prickly pear (*Opuntia humifosa*), needleleaf rosette grass (*Dicanthelium aciculare*), Garber's blazing star (*Liatris garberi*), sand post oak (*Quercus margaretta*), vanilla leaf (*Carphephorus odoratissimus*), orange milkwort (*Polygala lutea*), swamp titi (*Cyrilla racemiflora*), sweetbay magnolia (*Magnolia virginiana*), fetterbush (*Lyonia lucida*), Apalachicola St. John's-wort (*Hypericum chapmanii*), muscadine (*Vitis rotundifolia*), dwarf huckleberry (*Gaylussica dumosa*), laurel greenbrier (*Smilax laurifolia*), and narrowleaf yellowtops (*Flaverina linearis*).

The Flightline Area project area is mostly comprised of developed land use (96 percent). Approximately one percent of the area is comprised of drainage features and three percent is comprised of herbaceous, undeveloped uplands.

A majority of the Silver Flag Area project area is comprised of developed land use (91 percent) and the remaining nine percent of the area is herbaceous, undeveloped uplands.

The Support Area project area consists mostly of undeveloped uplands (68 percent) followed by 30 percent developed land use and two percent wetlands and other surface waters (forested and natural streams). Based on the field reviews, majority of this area has been previously developed or clear-cut. Portions of the area that remain vegetated primarily consist of seedlings and saplings of water oak (*Quercus nigra*), live oak (*Q. virginiana*), and sweetbay magnolia along with saw palmetto, fetterbush, muscadine, common persimmon, gallberry, saw greenbrier, slash pine, American sycamore (*Platanus occidentalis*), water oak, sabal palm (*Sabal palmetto*), Napier grass (*Pennisetum purpureum*), broomsedge bluestem, black-jack (*Bidens pilosa*), southern dewberry (*Rubus trivialis*), saw greenbrier, and large-leaf pennywort.

The Multi-Area project areas are comprised of 51 percent undeveloped uplands, 39 percent developed land use, and 10 percent wetlands/other surface waters. Based on the field reviews, these areas consist mostly of maintained road rights-of-way and landscaping.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.8.1.2 Wildlife

The numerous biotic communities occurring on Tyndall AFB provide habitat and support for a high diversity of terrestrial and aquatic animal species. A common assemblage of mammal species inhabiting this region includes least shrew (*Cryptodus parva*), eastern red bat (*Lasiurus borealis*), pocket gopher (*Geomys pinetus*), eastern mole (*Scalopus aquaticus*), cotton mouse (*Peromyscus gossypinus*), eastern gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), salt marsh rabbit (*Sylvilagus aquaticus*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), and North American opossum (*Didelphis virginiana*) (Air Force, 2019d).

Due to the subtropical climate and variety of wetland, shoreline, and woodland ecosystems, a wealth of bird species have the potential to reside within the habitat types located on Tyndall AFB. Regularly encountered avian species include pie-billed grebe (*Podilymbus podiceps*), anhinga (*Anhinga anhinga*), snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), northern bobwhite (*Colinus virginianus*), American coot (*Fulica americana*), killdeer (*Charadrius vociferous*), willet (*Tringa semipalmata*), least sandpiper (*Calidris minutilla*), American woodcock (*Scolopax minor*), ring-billed gull (*Larus delawarensis*), mourning dove (*Zenaida macroura*), great horned owl (*Bubo virginianus*), belted kingfisher (*Megaceryle alcyon*), red-bellied woodpecker (*Melanerpes carolinus*), eastern phoebe (*Sayornis phoebe*), American crow (*Corvus brachyrhynchos*), tufted titmouse (*Baeolophus bicolor*), Carolina wren (*Thryothorus ludovicianus*), eastern bluebird (*Sialia sialis*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), yellow-rumped warbler (*Setophaga coronata*), song sparrow (*Melospiza melodia*), and northern cardinal (*Cardinal cardinalis*).

Typical herpetofauna for the region include eastern newt (*Notophthalmus viridescens*), southeastern slimy salamander (*Plethodon grobmani*), southern toad (*Anaxyrus terrestris*), green tree frog (*Hyla cinerea*), bull frog (*Lithobates catesbeiana*), southern leopard frog (*Lithobates sphenoccephala*), American alligator (*Alligator mississippiensis*), common snapping turtle (*Chelydra serpentina*), common musk turtle (*Sternotherus odoratus*), box turtle (*Terrapene carolina*), red-eared slider (*Trachemys scripta*), Florida softshell (*Apalone ferox*), green anole (*Anolis carolinensis*), fence lizard (*Sceloporus undulates*), five-lined skink (*Plestiodon fasciatus*), six-lined racerunner (*Aspidocetes sexlineatus*), slender glass lizard (*Ophisaurus attenuatus*), banded water snake (*Nerodia fasciata*), garter snake (*Thamnophis sirtalis*), eastern hognose snake (*Heterodon platirhinos*), black racer (*Coluber constrictor*), rough green snake (*Opheodrys aestivus*), corn snake (*Pantherophis guttata*), gray rat snake (*Pantherophis obsoleta*), king snake (*Lampropeltis getula*), cottonmouth (*Agkistrodon piscivorus*), and eastern diamondback rattlesnake (*Crotalus adamanteus*).

Common freshwater fish species found on Tyndall AFB include sheepshead minnow (*Cyprinodon variegatus*), long-nosed killifish (*Fundulus similis*), largemouth bass (*Micropterus salmoides*), spotted sunfish (*Lepomis punctatus*), bluegill (*Lepomis macrochirus*), and channel catfish (*Ictalurus punctatus*).

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.8.1.3 Federally Listed Species

The ESA (16 U.S.C. 1532 et. seq.) of 1973, as amended, was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. All Federal agencies are required to implement protection programs for designated species and to use their authorities to further the purposes of the act. Responsibility for the identification of a threatened or endangered species and development of any potential recovery plans lies with the Secretary of the Interior and the Secretary of Commerce. The Secretary of the Interior and the Secretary of Commerce (marine species) are responsible for the identification of threatened or endangered species and development of any potential recovery plan.

USFWS is the primary agency responsible for implementing the ESA, and is responsible for birds and other terrestrial and freshwater species. USFWS responsibilities under the ESA include (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other Federal agencies concerning measures to avoid harm to listed species.

A Biological Assessment prepared by the USFWS staff at Tyndall AFB (USFWS, 2019a) assessed potential impacts on threatened or endangered species as a result of the Proposed Action (**Appendix C**). The Air Force and USFWS have completed Section 7 consultation regarding potential impacts to threatened or endangered species, including project-specific consultations due to the presence of telephus spurge (*Euphorbia telephoides*) in the vicinity of Project SA-11. **Table 3.8-2** provides information about the federally listed species known to occur on Tyndall AFB and the adjacent Gulf of Mexico.

TABLE 3.8-2 FEDERALLY LISTED SPECIES ASSOCIATED WITH TYNDALL AFB

Scientific Name	Common Name	Federal Status	Location
Reptiles			
<i>Caretta</i>	Atlantic loggerhead sea turtle	T	Tyndall AFB, Gulf of Mexico
<i>Chelonia mydas</i>	Atlantic green sea turtle	E	Tyndall AFB, Gulf of Mexico
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	Tyndall AFB, Gulf of Mexico
<i>Gopherus polyphemus</i>	Gopher tortoise	C	Tyndall AFB
<i>Lepidochelys kempi</i>	Kemp’s Ridley sea turtle	E	Tyndall AFB, Gulf of Mexico
Birds			
<i>Calidris canutus rufa</i>	Red Knot	T	Tyndall AFB
<i>Charadrius melodus</i>	Piping plover	T	Tyndall AFB
Mammals			
<i>Peromyscus polionatus allophrys</i>	Choctawhatchee beach mouse	E	Tyndall AFB
<i>Peromyscus polionatus peninsularis</i>	St. Andrew beach mouse	E	Tyndall AFB
Plants			
<i>Euphorbia telephoides</i>	Telephus spurge	T	Tyndall AFB
<i>Pinguicula ionantha</i>	Godfrey’s butterwort	T	Tyndall AFB

Sources: USFWS, 2015; USFWS, 2019a.

Notes: E – Endangered; T – Threatened; C – Candidate

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Sea Turtles

Four species of sea turtles occur in the nearshore waters of the Gulf of Mexico and are known to nest on Tyndall AFB's barrier islands. These species include the Atlantic loggerhead sea turtle, Atlantic green sea turtle, leatherback sea turtle, and Kemp's ridley sea turtle. The loggerhead is the most common of the four species to nest on Tyndall AFB's beaches with occasional nesting by leatherback, green, and Kemp's Ridley sea turtles. The peak nesting period is June and July, with an average of 50 nests per year. Green sea turtle and leatherback sea turtle nesting was first documented at Tyndall AFB in 1998 and 2001, respectively. A Kemp's ridley was first observed laying a nest on Tyndall AFB in 2016 (Air Force, 2019d).

Atlantic loggerhead sea turtle (*Caretta caretta*)

The loggerhead sea turtle is federally and state listed as threatened in the Florida panhandle. This species was originally listed as threatened throughout its global range in 1978 but the listing status was revised in 2011 by creating nine distinct population segments of which four segments are federally threatened and the other five segments are federally endangered (USFWS, 2011). Nesting females typically come ashore to dig nests and deposit eggs between 1 May and 31 August with peak nesting activity occurring in June and July. Nests are dug between the mean high water (MHW) mark and the dune line with nests periodically created in the dunes. Within one nesting season, individual loggerheads are known to nest from one to seven times. On-shore threats to the loggerhead sea turtle include degradation or destruction of nesting habitat from coastal development, hatchling disorientation due to beachfront lighting, and nest depredation. The loggerhead is the most common nesting sea turtle on Tyndall AFB and is known to nest on Shell Island, Crooked Island West, Crooked Island East, and occasionally Buck Beach (Air Force, 2019d). Critical habitat has not been designated for loggerhead sea turtles along the Gulf Coast of Florida.

Atlantic green sea turtle (*Chelonia mydas*)

Populations of the green sea turtle are federally and state listed as endangered in Florida and on the Pacific Coast of Mexico with all other populations listed as threatened in its eastern range of North America (USFWS, 1978). Green sea turtles usually nest between June and September and a nesting female can lay as many as nine nests in a season (National Marine Fisheries Service and USFWS, 1991). This species typically breeds at two-to four-year intervals and very rarely breeds every year. On-shore threats to this species are the same as threats for loggerhead sea turtles. Green sea turtle nesting events are fairly uncommon on Tyndall AFB's beaches with the exception of the 2019 nesting season during which 20 green sea turtle nests were documented. There has been no designation of critical habitat for green sea turtles along Florida's Gulf coast.

Kemp's ridley sea turtle (*Lepidochelys kempii*)

The Kemp's ridley sea turtle is federally and state listed as endangered throughout its global range (USFWS, 1970). The range of the Kemp's ridley includes the Gulf of Mexico and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland. Nesting is essentially limited to the beaches of the western Gulf of Mexico, primarily in Tamaulipas and Veracruz, Mexico with a few

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

historical records in Campeche, Mexico. The major habitat for Kemp's ridleys is the nearshore and inshore waters of the northern Gulf of Mexico. Kemp's ridley sea turtles nest from April to July with mean clutch sizes of approximately 100 eggs. Females can breed annually and mean number of nests per season is 2.5. On-shore threats to this species are the same as threats for loggerhead sea turtles. The first confirmed Kemp's ridley nest on Tyndall AFB was detected on May 24, 2016 on Crooked Island West. Critical habitat has not been designated for Kemp's ridley sea turtles along the Gulf Coast of Florida.

Leatherback sea turtle (*Dermochelys coriacea*)

The leatherback sea turtle is federally and state listed as endangered throughout its global range (USFWS, 1970). Only infrequent nesting activity has been documented for the leatherback in northwest Florida (Longieliere et al., 1997). The nesting and hatching season for the leatherback extends from May 1 through September 30, with nest incubation ranging from 60 to 75 days occurring on two to three-year intervals (Longieliere et al., 1997). Since 2001, there have been three documented cases of leatherback turtle nesting on Tyndall AFB. Critical habitat has not been designated for leatherback turtles along the Gulf coast of Florida.

Tyndall AFB Sea Turtle Monitoring and Management

The primary objectives of the Tyndall AFB sea turtle monitoring program are to 1) collect data annually to determine the distribution and abundance of sea turtle nesting activity on 18 miles of Tyndall AFB's Gulf of Mexico beaches, and 2) provide nest location information for military mission avoidance purposes. Additional data gathered during nesting surveys includes incubation period, nest depredation, hatchling disorientation, and nest success (hatchling emergence). Surveys are conducted in accordance with data collection and reporting protocols defined in the Marine Turtle Permit. Sea turtle nesting surveys are conducted five times per week on Crooked Island West and East, and the Federal section of Shell Island (18 miles of beach in total) from 1 May to 31 August. The surveys are designed to 1) locate the crawls of nesting female turtles, 2) determine crawl status (i.e. nesting crawl vs. false crawl), 3) species identification, and 4) nest protection. Data collected for each crawl and/or nest includes global positioning system coordinates of crawl/nest, crawl length and width, presence of dunes in the vicinity, distance from MHW mark to dunes, and dune height. If a body pit is identified at the crawl site, eggs are located and wire screens are secured over nest site to deter predation. Post-hatching surveys are conducted 1 September to 31 October to determine nest success. Nests are assessed for evidence of hatching activity, predation, inundation, and storm damage and continue to be monitored until three days after hatchlings have emerged.

The primary objective of sea turtle management at Tyndall AFB is to support the military mission while meeting the legal requirements of the ESA. Tyndall AFB's 18 miles of undeveloped beaches provide a valuable land to sea transition zone for training purposes and also serve as high quality habitat for nesting sea turtles. The primary goals of sea turtle conservation and management at Tyndall AFB include 1) locating and protecting nests, 2) nest relocation when necessary, 3) predator removal, 4) resolution of beach lighting issues, 5) beach driving restrictions, and 6) restoration and protection of nesting habitat. In addition to using screening to protect nests, predator control in the form of trapping and removing predators from Tyndall AFB's beaches is conducted.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Lighting has only occasionally been problematic for sea turtles on Tyndall AFB's beaches resulting in hatchling disorientation. Artificial lighting problems are identified and addressed as quickly as possible. Currently, the only lighting issues on Tyndall AFB beaches are from urban glow originating from Panama City and Mexico Beach but incidences of hatchling disorientation resulting from urban glow have been minimal. Additionally, a wildlife friendly lighting plan is being developed for Tyndall AFB and will be incorporated in the rebuilding of the base infrastructure reducing the potential for sea turtle disorientation caused by artificial lighting.

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is state-listed as threatened by the Florida FWC and is considered a candidate species for Federal listing by USFWS due to habitat loss, degradation, and a declining number of individuals. The gopher tortoise requires well-drained, loose, sandy soils for burrowing, and low-growing herbs and grasses for food. Gopher tortoises are known to occur on Tyndall AFB and suitable habitat is available within the proposed project areas. However, no burrows or individuals were observed during the field reviews. Critical habitat has not been designated for the gopher tortoise in Florida.

Piping Plover (*Charadrius melodus*)

The piping plover is federally and state listed as threatened. This shorebird breeds in three geographic regions in the U.S. and are therefore divided into three breeding populations which include the Atlantic Coast, Great Lakes and North Great Plains. All three populations winter along beaches and barrier islands from North Carolina to Florida, and along the Florida Gulf Coast to Texas, Mexico, and the Caribbean. Piping plover preferred wintering habitat used for foraging and roosting includes beaches, salt marshes, coastal lagoons, and sand, mud, and algal flats (USFWS, 2003). Piping plovers consistently winter along Tyndall AFB's shoreline during the non-breeding (wintering and migrating) season from July 15 through May 15. Concentration is highest in areas containing pools and low elevation beach sites that are washed over and exposed by tidal fluctuations. Tyndall AFB's over-wintering population normally reaches 18 percent of all birds utilizing Florida as an over-wintering location. Portions of the barrier islands on Tyndall AFB have been designated critical habitat for the piping plover. Primary threats to the piping plover on wintering grounds include degradation and destruction of habitat, human disturbance, and predators.

Piping Plover Critical Habitat and Species Management

Critical habitat designation for wintering and breeding grounds for the piping plover was published in the Federal Register on 10 July 2001 (USFWS, 2001) (Unit FL-5: Shell/Crooked Islands in Bay County). Piping plover critical habitat is a term defined in the ESA that refers to specific geographic areas that contain the essential habitat features necessary for the conservation of threatened and/or endangered species. At the time of designation, the critical habitat areas do not necessarily have to be occupied by piping plovers. Critical habitat areas may require special protection or management considerations for current populations as well as potential population increases necessary to achieve species recovery.

The primary management for piping plovers on Tyndall AFB consists of maintaining suitable wintering habitat for foraging, sheltering, and roosting. Management activities conducted at Tyndall AFB that

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

benefit non-breeding piping plovers include 1) predator removal, 2) beach driving restrictions, 3) construction and maintenance of boardwalks, and 4) Critical Wildlife Area and Critical Habitat designations. Specific coastal dune protection and restoration measures at Tyndall AFB that may benefit piping plovers include 1) construction of elevated boardwalks on Crooked Island East and NCO beach (access point for Crooked Island West and Shell Island) to eliminate pedestrian traffic in and around dunes and prevent erosion, and 2) protection of dunes (via sand fence installation) by vegetating with sea oats to encourage establishment. Tyndall AFB recreation regulations also requires pedestrians to access the beach via marked roads or boardwalks and to stay out of sand dunes at all times (Tyndall AFB, 2015).

Red Knot (*Calidris canutus rufa*)

The red knot is federally and state threatened and migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the southeastern U.S., northeastern Gulf of Mexico, northern Brazil, and the southern tip of South America (USFWS, 2014). Staging and stopover areas in the wintering regions are used for resting and foraging. They winter at intertidal marine habitats near coastal inlets, estuaries, and bays. Wintering grounds for the red knot include coastal sites from Massachusetts and California southward to southern South America. Knots and other shorebirds depend on quiet, intertidal beach locations as resting sites during high tides. Migrating and wintering knots use marine habitats including sandy beaches, salt marshes, lagoons, mudflats of estuaries and bays, and mangrove swamps that contain an abundance of invertebrate prey. The red knot is observed at Tyndall AFB during migration, in particular on Crooked Island West, Crooked Island East, and Shell Island. Primary threats to the piping plover on wintering grounds include degradation and destruction of habitat, human disturbance, and predators. The red knot occurs in small numbers at Tyndall AFB during migration. It has similar habitat requirements and is present during similar time periods as the piping plover.

The primary management for red knots at Tyndall AFB includes maintaining suitable wintering habitat for foraging, sheltering, and roosting. Management activities conducted at Tyndall AFB that benefit this species include 1) predator removal, 2) beach driving restrictions, 3) construction and maintenance of boardwalks, and 4) Critical Wildlife Area and critical habitat designations.

Choctawhatchee Beach Mouse (*Peromyscus polionotus allophrys*)

The Choctawhatchee beach mouse is federally and state listed as endangered and populations are currently known to occur in Bay, Okaloosa, and Walton counties in the Florida Panhandle (USFWS, 1987; USFWS, 2006). They inhabit coastal dunes on Shell Island and Crooked Island West at Tyndall AFB and their distribution ranges from Choctawhatchee Bay to St. Andrew Bay, Florida. The Choctawhatchee beach mouse was detected on Shell Island as early as 1950. In 1998, Shell Island and Crooked Island West became connected at East Pass due to the accretion of sand that had expanded southward on the eastern end of the Federal portion of Shell Island. The connection of Shell Island and Crooked Island West provided the opportunity for Choctawhatchee beach mice inhabiting Shell Island to expand their range to Crooked Island West. Presence of the Choctawhatchee beach mouse on Crooked Island West was confirmed during trapping events in 2000 and the presence of the Choctawhatchee beach mouse continues to be monitored on Crooked Island West and Shell Island to date (USFWS, 2010).

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

St. Andrew Beach Mouse (*Peromyscus polionotus peninsularis*)

The St. Andrew beach mouse is federally and state listed as endangered. Prior to the 1980s, there were two populations of this subspecies, one known to occur on Crooked Island East at Tyndall AFB and the other occurring on St. Joseph Peninsula, Gulf County, Florida. However, a 1992-1993 trapping event on Crooked Island East produced zero captures of the St. Andrew beach mouse and the subspecies was therefore thought to be extirpated from Crooked Island East. Re-introduction of 43 individuals to Crooked Island East from the St. Joseph Peninsula State Park population occurred between November 1997 and December 1998 (USFWS, 2010) and the presence of the St. Andrew beach mouse continues to be monitored on Crooked Island East to date.

Choctawhatchee and St. Andrew Beach Mouse Habitat, Threats, and Management

The Choctawhatchee beach mouse and St. Andrew beach mouse inhabit primary, secondary, and inland tertiary dunes within well-developed coastal dune ecosystems (USFWS, 2010). They are burrow-inhabiting animals but move around within their home range to forage, breed, and maintain other burrows that they have created (USFWS, 1987). Principal threats that have led to the decline of the Choctawhatchee beach mouse and the St. Andrew beach mouse include habitat degradation or loss due to land development, catastrophic storm events, and human recreational activity on dunes. Other potential threats include shoreline erosion, predators, and artificial beach lighting.

The primary goals of beach mouse conservation and management at Tyndall AFB consist of 1) dune restoration and protection, 2) predator removal, 3) resolution of beach lighting issues, and 4) beach driving restrictions, 5) designation of critical habitat. Additional coastal dune protection measures on Crooked Island West, Crooked Island East and Shell Island at Tyndall AFB include the construction and maintenance of boardwalks, sand fence installation, and beach driving restrictions. Specific coastal dune protection and restoration measures at Tyndall AFB include 1) construction of an elevated boardwalk on Crooked Island East and NCO beach to eliminate pedestrian traffic in and around dunes, and 2) protection of dunes (via sand fence installation) by vegetating with sea oats to encourage establishment. Predator control in the form of trapping and removing predators from Tyndall's beaches is conducted. Artificial light pollution is minimized on all Tyndall AFB beaches during the sea turtle nesting season (May 1 to August 30), which directly benefits the nocturnal Choctawhatchee and St. Andrew beach mice. Prior to the approval of the INRMP (Air Force, 2019d), critical habitat had been designated for the St. Andrew beach mouse on Crooked Island West and for the Choctawhatchee beach mouse on Crooked Island West and Shell Island to ensure protection of their coastal dune habitat.

Godfrey's Butterwort (*Pinguicula ionantha*)

Godfrey's butterwort is listed as federally threatened and state endangered and is known to occur in Bay, Calhoun, Franklin, Gulf, Liberty, and Wakulla counties in the Florida Panhandle (USFWS, 1994). It is a carnivorous plant that inhabits herb bogs, flatwoods depressions, savannas, and ditches adjacent to the aforementioned habitats historically embedded within the longleaf pine matrix (Godfrey and Wooten, 1981; Wunderlin and Hansen, 2011). Godfrey's butterwort often occurs in areas that are seasonally inundated with shallow water. Ecosystem degradation is the primary threat to this species resulting from commercial forest production, inadequate prescribed fire management, fire exclusion, and urban

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

development. Other threats include shading from the overstory pines and midstory shrubs, drainage of wetlands, and water quality degradation (USFWS, 1994).

Prescribed fire is the most important management tool for improving or maintaining suitable habitat for Godfrey's butterwort at Tyndall AFB. Commercial timber production coupled with fire exclusion had been the primary reasons for ecosystem degradation at Tyndall AFB since the 1960s. Re-introduction of prescribed fire began in 1996 when the Forestry Department began a prescribed fire program across the base. Seasonality of prescribed fire may be one of the most important factors related to Godfrey's butterwort habitat improvement due to its habitat preferences (wettest edges of the ecotone between herbaceous wetlands and upland pine flatwoods). Since 1996, Tyndall AFB natural resources staff has been working to accomplish more growing season burns as well as promote burning through wetlands. Mechanical removal of the shrub layer in wetlands began in 2018 to improve habitat for Godfrey's butterwort and other listed species that have been difficult to manage with prescribed fire.

Telephus spurge (*Euphorbia telephioides*)

Telephus spurge is a perennial herbaceous plant species listed as federally threatened and state endangered and is currently restricted to coastal (within four miles of the coast) Bay, Franklin, and Gulf counties in the Florida Panhandle (USFWS, 2007). Populations of this species have been observed on a variety of sites including xeric scrub pine to mesic pine flatwoods, disturbed sandy roads, and less commonly in wetlands with seepage slope species. Telephus spurge can also be found in pine flatwoods or upland pine communities with a longleaf pine and/or slash pine overstory and herbaceous understory dominated by wiregrass, other grasses, and forbs that have historically been burned on a two- to three-year fire return interval. It is generally found inhabiting sites with sandy, acidic soil with little to no litter and low organic and moisture content (Peterson and Campbell, 2007). This species is characterized as ephemeral in that it can appear suddenly and be abundant at newly disturbed sites but may not be there upon re-survey a few years later. Large tuberous roots allow this species to survive underground when subjected to suboptimal or poor habitat conditions. The primary threats to telephus spurge include habitat degradation and destruction caused by commercial timber production, inadequate prescribed fire management, fire exclusion, and urban development (USFWS, 2007).

Commercial timber production coupled with fire exclusion had been the primary reasons for ecosystem degradation at Tyndall AFB. Prescribed fire is the most important management tool for improving or maintaining habitat for telephus spurge at Tyndall AFB as this species is thought to respond with prolific emergence following fire (Kaeser, 2018). The Tyndall AFB natural resources staff has been working to promote more burning during the growing season as well as burning on an 18- to 30-month fire return interval, benefiting telephus spurge. Longleaf pine restoration efforts in slash pine plantations (pine flatwoods) and former sand pine plantations coupled with low intensity, frequent fire will improve potential habitat for telephus spurge on Tyndall AFB.

3.8.1.4 State Listed Species

While the USFWS has primary responsibility for Florida species that are federally endangered or threatened, the FWC maintains a list of Florida's imperiled state listed animal species. The Florida Department of Agriculture and Consumer Services (FDACS) maintains a list of regulated plant species.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

A list of state-protected plant and animal species with potential to occur at Tyndall AFB is provided in **Table 3.8-3**. This list does not include those species both state and federally listed as they are described above.

TABLE 3.8-3. STATE-LISTED SPECIES WITH POTENTIAL TO OCCUR AT TYNDALL AFB

Scientific Name	Common Name	State Status
Plants		
<i>Asclepias viridula</i>	Southern milkweed	E
<i>Chrysopsis godfreyi</i>	Godfrey's golden aster	T
<i>Cleistes bifaria</i>	Small spreading pogonia	T
<i>Drosera filiformis</i>	Dew thread sundew	T
<i>Drosera intermedia</i>	Spoon-leaved sundew	E
<i>Eurybia spinulosa</i>	Apalachicola aster	E
<i>Gentiana pennelliana</i>	Wiregrass gentian	E
<i>Justicia crassifolia</i>	Thick-leaved water willow	T
<i>Lilium catesbaei</i>	Southern red lily	T
<i>Lupinus westianus</i>	Gulf coast lupine	E
<i>Oxypolis greenmanii</i>	Giant water dropwort	T
<i>Physostegia godfreyi</i>	Apalachicola dragonhead	T
<i>Pinguicula lutea</i>	Yellow-flowered butterwort	T
<i>Pinguicula planifolia</i>	Chapman's butterwort	E
<i>Pogonia ophioglossoides</i>	Snakemouth orchid	E
<i>Polygonella marcophylla</i>	Large-leaved jointweed	T
<i>Ruellia noctiflora</i>	White-flowered wild petunia	T
<i>Sarracenia psittacina</i>	Parrot pitcher plant	T
<i>Sarracenia rosea</i>	Purple pitcher plant	T
<i>Verbesina chapmanii</i>	Chapman's crownbeard	E
<i>Xyris isoetifolia</i>	Quillwort yellow-eyed grass	E
<i>Xyris longisepala</i>	Karst pond yellow-eyed grass	E
<i>Xyris scabrifolia</i>	Harper's yellow-eyed grass	T
Reptiles		
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	T
Birds		
<i>Charadrius nivosus</i>	Snowy plover	T
<i>Egretta caerulea</i>	Little blue heron	T
<i>Egretta rufescens</i>	Reddish egret	T
<i>Egretta tricolor</i>	Tricolored heron	T
<i>Falco sparverius paulus</i>	Southeastern American kestrel	T
<i>Haematopus palliatus</i>	American oystercatcher	T
<i>Platalea ajaja</i>	Roseate spoonbill	T
<i>Rynchops niger</i>	Black skimmer	T
<i>Sternula antillarum</i>	Least Tern	T
Mammals		
<i>Ursus americanus floridanus</i>	Florida black bear	NL*

Sources: FDACS, 2010; FWC, 2018.

Notes: E – Endangered; T – Threatened; NL – Not Listed

* The Florida black bear is no longer state-listed; however, this species is managed in Florida by the FWC's Florida Black Bear Conservation rule (68A-4.009, F.A.C.).

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

State-Listed Plant Species

Several plants species state listed by the FDACS have the potential to occur at Tyndall AFB in various habitats. However, during the October and November 2019 field surveys, no state listed plant species were observed within the proposed project areas.

Florida pine snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is state listed as threatened and prefers sandhill, old fields, and pastures with sandy soils as well as sand pine scrub and scrubby flatwoods. It may use gopher tortoise burrows for shelter to escape hot or cold ambient temperatures within its range. Marginally suitable habitat for this species is available within the proposed project areas within the pine plantations and grassy upland areas. No pine snakes were observed during the field reviews.

Snowy Plover (*Charadrius nivosus*)

The snowy plover is state listed as threatened and is typically found on open, sandy beaches and on tidal mudflats and sandflats along both coasts. Piping plovers spend a large portion of their year “wintering” in Florida but do not breed there. Pairs of piping plovers arrive at breeding grounds from southern Canada to Nebraska starting in late March and early April. The main threat to piping plovers is habitat loss as development on beaches has reduced the amount of suitable wintering areas available. Other threats include predation from raccoons, skunks, and foxes (FWC, 2019a).

Little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), tricolored heron (*Egretta tricolor*), and roseate spoonbill (*Platalea ajaja*)

The little blue heron, reddish egret, tricolored heron and roseate spoonbill are all state-listed as threatened and occur statewide where they forage in a variety of coastal and inland wetlands including swamps, marshes and the edges of water bodies. Nesting occurs in a variety of forested or shrub wetlands. Suitable foraging and nesting habitat for these species is present within the proposed project areas in the herbaceous and shrub wetlands. No wading birds were observed during the field reviews.

American oystercatcher (*Platalea ajaja*), black skimmer (*Rynchops niger*), and least tern (*Sternula antillarum*)

The American oystercatcher, black skimmer, and least tern are all state listed as threatened and inhabit beaches, sandbars, spoil islands, shell rakes, salt marsh, and oyster reefs. These shorebirds are found from the coasts of the northeastern U.S. down to Florida’s Gulf Coast. Habitat loss due to coastal development is the main threat to these shorebirds. Shorebirds are known to occur on Tyndall AFB along the Gulf Coast shoreline.

Southeastern American kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is listed as threatened and is non-migratory. The species utilizes open habitats for foraging and nests in tree cavities. Habitats such as pine scrub, dry prairies, mixed pine and

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

hardwood forests, and pine flatwoods are preferable for the southeastern American kestrel. While suitable habitat for this species is available in the forested uplands, no individuals or nests were observed during the field reviews.

Florida Black Bear (*Ursus americanus floridanus*)

Although the Florida black bear has been removed from the state listing, it is still protected and managed by the FWC pursuant to the Florida Black Bear Conservation Rule 68A-4.009, F.A.C. The Florida black bear can be found statewide in a number of habitats including mixed hardwood pine communities, cabbage palm hammock and forested wetland systems. This species tends to den alone within tree cavities, river banks, logs or caves. They will also seek shelter on the ground in palmetto thickets, gallberry, fetterbush, and sweet pepperbush. Marginally suitable habitat for the black bear is available within the proposed project areas in the forested upland and wetland areas. Established by the FWC, a Bear Management Unit (BMU) is a geographic location bounded by county and/or state borders with one of the seven Florida black bear subpopulations within it. The goal of a BMU is to provide a defined area within which FWC can have a community-focused effort to effectively manage and conserve Florida black bears (FWC, 2019b). According to FWC, Tyndall AFB is located within the East Panhandle BMU where their occurrence is classified as “frequent”. No black bears were observed at Tyndall AFB during the field reviews.

3.9 CULTURAL RESOURCES

Cultural resources include historic properties, which are prehistoric or historic buildings, sites, districts, objects, or structures eligible for the National Register of Historic Places (54 U.S.C. 300308 and 36 CFR 800.16(l)(1)). Also included are properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet National Register eligibility criteria. This section describes the state of knowledge pertaining to cultural resources, including previously reported archaeological sites and historic resources, as well as previously conducted research in the area of potential effect of the Proposed Actions.

Based on previous government to government consultations, affiliated Native American tribes have indicated that there are no historic properties of religious or tribal significance located on Tyndall AFB. For this EA, Tyndall AFB conducted an archaeological survey to inventory and identify Historic Properties as defined by 36 CFR Part 800. The findings of this survey were used to inform the **Section 3.9.1** Affected Environment below.

3.9.1 AFFECTED ENVIRONMENT

The prehistory of the Florida Panhandle/northwestern Florida region extends deep into remote antiquity, is unquestionably complex, and as a result has many unresolved controversies. A comprehensive discussion of the prehistoric record and the divergent opinions of specialists are beyond the scope of this section. The major culture periods generally recognized for northwestern Florida include the Paleoindian Period, Archaic Period, Woodland Period, Mississippian Period (some scholars combine this with the Woodland Period), Protohistoric Period, and the Historic Period (**Table 3.9-1**). Each of the major periods is further divided into multiple sub-periods and local phases based on the nature of the local

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

archaeological record. Each of the local phases in **Table 3.9-1** will be briefly summarized below. A more comprehensive synthesis of the prehistory and history of Tyndall AFB is provided in the Air Force Integrated Cultural Resources Management Plan (ICRMP) Tyndall AFB (Air Force, 2016a). This document is hereby incorporated by reference.

As a Federal land manager, Tyndall AFB is obligated to implement regulations set forth in Section 110 of the NHPA of 1966, as amended (codified at 54 U.S.C. 306101) and its implementing regulations. Tyndall AFB cultural resources are managed by Tyndall Environmental Management Flight with support from Eglin Installation Support Section of AFCEC and the Eglin Cultural Resources Management (CRM) team. Under Section 110 of the NHPA, Federal agencies are required to develop a historic preservation program and are encouraged to take efforts to locate and preserve cultural resources on properties under Federal management or control regardless of future use or disturbance. As such, Tyndall AFB developed an ICRMP (Air Force, 2016a) with updated support from Eglin CRM and maintains an inventory of all previously reported cultural resources on Tyndall AFB managed lands, as well as an account of all the land that has previously been surveyed on the installation. This documentation is useful for project planning, managing the protection and preservation of known cultural resources, and inventorying lands that have not been investigated for the presence of cultural resources. In the case of this particular project this documentation was useful in determining which proposed project areas have not previously been surveyed and whether any Proposed Actions overlapped previously reported cultural resources.

As reported in **Appendix D**, the Support Area has recently been surveyed for cultural resources for the purposes of this EA (Wood, 2019). Three additional areas were identified in consultation with the Eglin AFB CRM as having not been subject to adequate cultural resources inventory surveys, the Flightline Area, Munitions Area, and 8500 Area. These three areas, shown on **Figure 3.9-1**, were subject to further investigation to determine whether the Proposed Actions in those areas would have adverse effects to cultural resources. The investigation into these three areas is described below.

TABLE 3.9-1 CULTURAL CHRONOLOGY OF NORTHWESTERN FLORIDA

Culture Period	Subperiod	Phase/Culture(s)	Approximate Years Before Present
Historic	-	American	195 – present
		European	350 – 195
Protohistoric	-	Bear Point	550/450 – 350
Mississippian	-	Fort Walton - Pensacola	1050 – 550/450
Woodland	Late Woodland	Weeden Island - Wakulla	1650 – 1050
	Middle Woodland	Santa Rosa-Swift Creek	1740 – 1650
	Early Woodland	Deptford	2500 – 1740
Archaic	Late Archaic	-	5000 – 2500
	Middle Archaic		7000 – 5000
	Early Archaic		9500 – 7000
Paleoindian	-	-	12,000 – 9500

Source: Air Force, 2016a.

This page intentionally left blank.



Cultural Resources Survey Areas

Figure 3.9-1

This Page Intentionally Left Blank

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.9.1.1 Previous Investigations

Search of the Florida Master Site File (FMSF) and Tyndall AFB’s cultural resources inventory has revealed that 29 cultural resources investigations have been conducted within 1.6 kilometers (km) (1.0 mile) of the selected project survey parcels. These investigations include cultural resources assessments, monitoring reports, historic building inventories and evaluations, and Phase I archaeological surveys similar to the one proposed in this document. **Table 3.9-2** summarizes the previous investigations conducted within 1.6 km (1.0 mile) of the proposed project alternative areas. Three previous investigations overlap portions of the survey areas to be investigated in the current project. These surveys include FMSF Survey Numbers 138 (Knudsen et al., 1979), 1387 (Campbell and Thomas, 1985), and 22358 (Bartlett et al., 2015).

TABLE 3.9-2 PREVIOUS SURVEYS CONDUCTED WITHIN 1.6 KILOMETERS (1 MILE) OF THE PROJECT SURVEY AREAS

Survey Number	Title	Year	Authors
138	Partial Cultural Resource Inventory of Tyndall AFB, Florida	1979	Knudsen, Gary, D. and James W. Stoutmire
424	Cultural Resources Survey of the Proposed Drone Runway and Supporting Facilities, Tyndall AFB	1976	Nielsen, Jerry
1387	Cultural resources investigation at Tyndall AFB, Bay County, Florida.	1985	Campbell, Janice L. and Prentice M. Thomas Jr.
9493	Identification and Evaluation of Historic Properties Within the One Mile Area of Potential Effects of the Proposed 160-foot Beacon Beach (Tyndall AFB) Wireless Telecommunications Tower (American Tower Corporation #224680), Bay County, Florida	2003	Parker, Brian T.
11134	Assessment of Potential Effects Upon Historic Properties: Proposed 160-Foot Panama 11 Wireless Telecommunications Tower (Sprint Site Number 224680), Bay County, Florida	2005	Parker, Brian T.
14993	Phase I Archaeological Survey of an Alternate Drone Launch System Site at Tyndall AFB, Bay County, Florida	2007	RabbySmith, Steven
17904	Phase I Archaeological Survey of the Site DB039 Debris Dump Tract, Tyndall AFB, Bay County, Florida	2010	RabbySmith, Steven L., RPA
18397	Cultural Resources Survey of TY-2 Cultural Resources Management Support, Tyndall AFB, Bay County, Florida	2010	Bourgeois, Carrie Williams, Christina M. Callisto, and Janice L. Campbell
20366	Limited Phase I Archaeological Investigation & Monitoring of Environmental Restoration Site LF005, Tyndall AFB, Bay County Florida	2013	Aubuchon, Benjamin, James R, Morehead, and Christina Zimmerman
20607	Cultural Resources Survey of Five Timber Tracks Contract FA4890-04-D-0009-DK13 Cultural Resources Management Support, Tyndall AFB, Bay County, Florida	2012	Callisto, Christina M. , Janice L. Campbell, and James H. Mathews
20958	Cultural Resources Survey of TY-100 & TY-101 (Task Order TY-13-0002) Contract W9128F-12-2-0002-0006 Cultural Resources Management Support, Tyndall AFB, Bay County, Florida	2014	Campbell, Janice L., Bret Kent, and James H. Mathews
22319	Cultural Resource Assessment Review Request Cultural Resource Reconnaissance Survey of SR30 (US98) from Tyndall AFB to the Gulf County Line. By Carl McMurray, February 1993.	1993	McMurray, Carl

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Survey Number	Title	Year	Authors
22358	Cultural Resource Assessment Survey for the State Road (SR) 30 (US 98) Alternative 7 Elevated Roadway at Tyndall AFB Entrance Bay County, Florida	2015	Bartlett, Laurel, Elizabeth, Chambless, Melissa Dye, and Jessica Fish
22458	Cultural Resources Survey of TY-112 (Task Order TY-14-0014) Contract W9128F-12-2-0002 Cultural Resources Management Support, Tyndall AFB, Bay County, Florida	2015	Campbell, Janice L., Sarah Deihl, and Erica Meyer
22532	Cultural Resources Survey of TY-111 (Task Order TY-14-0013) Contract W9128F-12-2-0002 Cultural Resources Management Support, Tyndall AFB, Bay County, Florida	2015	Campbell, Janice L., Ryan N. Clark, and James R. Morehead
22534	Cultural Resources Survey of TY-113 (Task Order TY-14-0015) Contract W9128F-12-2-0002 Cultural Resources Management Support, Tyndall AFB, Bay County, Florida	2015	Campbell, Janice L., Ryan N. Clark, and James R. Morehead
23221	Phase I Archaeological Investigation of Survey Areas TY-0134, Tyndall AFB, Bay County, Florida	2016	Benjamin Stewart, BA, Kathleen Furgerson, MA, RPA, Mark Martinkovic, MA, RPA
23223	Phase I Archaeological Investigation of Survey Area TY-0122 Tyndall AFB, Bay County, Florida	2016	Benjamin Stewart, BA, Kathleen Furgerson, MA, RPA, Mark Martinkovic, MA, RPA
23224	Archaeological Monitoring at 8By1765 in Association with GCEC Directional Bore, DHR Project No. 2015-5362 (Letter Report)	2016	TG Earnest
23830	Phase I Archaeological Investigation of Survey Area TY-0124 Tyndall AFB, Bay County, Florida	2016	Benjamin Stewart, BA, Kathleen Furgerson, MA, RPA, Mark Martinkovic, MA, RPA
23831	Phase I Archaeological Investigation of Survey Area TY-0123 Tyndall AFB, Bay County, Florida	2016	Benjamin Stewart, BA, Kathleen Furgerson, MA, RPA, Mark Martinkovic, MA, RPA
23832	Phase I Archaeological Investigation of Survey Areas TY-0131, Tyndall AFB, Bay County, Florida	2016	Furgerson, Kathleen, Mark Martinkovic, MA, RPA, and Scott Seibel
24164	Archaeological Survey of TY-142 Tyndall AFB, Bay County, Florida Task Order TY-16-0021 Contract W9128F-12-2-002	2017	Campbell, Janice L., Ryan N. Clark, and Zackery Cruze
24165	Archaeological Survey Unit TY-0137, 194 Acres, Tyndall AFB, Bay County, Florida Task Order TY-15-0004 Contract W9128F-12-2-002 Survey Unit TY-0137	2015	Bradley, Dawn M., Savannah L. Darr, and Stephen T. Mocas
24677	Archaeological Survey of TY-144 Tyndall AFB, Bay County, Florida Task Order TY-16-0022 Contract W9128F-12-2-0040	2017	Campbell, Janice L., Ryan N. Clark, and Zackery Cruze
24705	Archaeological Survey of TY-155 Tyndall AFB, Bay County, Florida Task Order TY-17-0007 Contract W9128F-12-2-0002	2017	Brannon, Shannon, Janice L. Campbell, and Ryan N. Clark
24725	Archaeological Surveys Conducted for the Upgrade for the Medical Facility Complex, Tyndall AFB, Bay County, Florida.	2017	Brown, Teresa L.
25042	Phase I Archaeological Investigation of Survey of TY-146 on Tyndall AFB, Bay County, Florida., Contract: W9128F-12-2-0002, Task Order: TY-17-0002	2017	Mikell, Gregory A.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Survey Number	Title	Year	Authors
25442	Phase I Archaeological Investigation of Survey of TY-158 and TY-159 on Tyndall AFB, Bay County, Florida., Contract: W9128F-12-2-0002, Task Order: TY-17-0014	2017	Mikell, Gregory A.

Source: FMSF, 2019; Air Force, 2016a.

FMSF Survey Number 138 was described in the report, *Partial Cultural Resource Inventory of Tyndall Air Force Base* (Knudsen et al., 1979). The investigation appears to have consisted of a base-wide inventory updating a summary of all of the cultural resources known to exist on the base at that time. It is unclear whether any fieldwork was conducted in support of the project. The project recorded 57 new resources and re-recorded either previously reported resources that included both archaeological sites and structures (Knudsen et al., 1979). None of the sites discussed are located in current project survey areas.

FMSF Survey Number 1387 also appears to have been a base-wide investigation reporting 29 new resources and 70 previously known resources that included both archaeological sites and structures (Campbell and Thomas, 1985). The findings were described in the report titled, *Cultural resources investigation at Tyndall Air Force Base, Bay County, Florida* (Campbell and Thomas, 1985). None of the resources reported are located within the current survey areas.

FMSF Survey Number 22358 is reported in *Cultural Resource Assessment Survey for the SR 30 (U.S. 98) Alternative 7 Elevated Roadway at Tyndall Air Force Base Entrance Bay County, Florida* (Bartlett et al., 2015). The investigation partially overlapped the northwestern portion of the Flightline Area in the current investigation. The investigation recorded two new resources and re-recorded 15 previously known resources that included both archaeological sites and structures (Bartlett et al., 2015). Ten of the structures were located in the Flightline Area and all were recommended ineligible for the National Register of Historic Places (NRHP). It is unclear what methods were employed during fieldwork during this investigation.

3.9.1.2 Previously Recorded Resources

The search of the FMSF and Tyndall AFB cultural resources inventory also revealed the presence of 31 archaeological sites (**Table 3.9-3**) and 205 historic structures within 1.6 km (1.0 mile) of the project survey areas. The vast majority of the archaeological sites previously recorded were located on land (land-terrestrial) and were not underwater sites. Within this population of cultural resources within 1.6 km (1.0 mile) of project survey areas is evidence for a continuous human presence dating from the Formative Period (Deptford Phase) to present. Sites range from prehistoric artifact scatters, middens and campsites to shell middens to historic period artifact scatters, camps, building remains, and historic wells. None of the previously reported archaeological sites are located within or overlap the current project alternative areas.

TABLE 3.9-3 PREVIOUS ARCHAEOLOGICAL SITES RECORDED WITHIN 1.6 KILOMETERS (1 MILE) OF THE PROJECT SURVEY AREAS

Site Number	Site Name	Site Type	Cultural/Temporal Association	Survey Recommendation	SHPO Recommendation
BY00025	Mound Near Pearl	Prehistoric burial mound(s)	Weeden Island, A.D. 450-1000	Not Evaluated by Recorder	Not Evaluated by SHPO

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Site Number	Site Name	Site Type	Cultural/Temporal Association	Survey Recommendation	SHPO Recommendation
	Bayou				
BY00132	East Bay Historic 1	Building remains, Homestead, Land-terrestrial, Historic refuse/dump, Artifact scatter-low density (< 2 per square meter)	Nineteenth century American, 1821-1899, Twentieth century American, 1900-present, American, 1821-present, Boom Times, 1921-1929, Depression and New Deal, 1930-1940, Fort Walton, A.D. 1000-1500, Post-Reconstruction, 1880-1897, Spanish-American War, 1898-1916	Eligible for NRHP	Eligible for NRHP
BY00134	East Bay 4	Land-terrestrial, Artifact scatter-low density (< 2 per square meter)	Indeterminate, Prehistoric with pottery	Ineligible for NRHP	Insufficient Information
BY00190	Tyndall AFB Aboriginal 7	Redeposited site (to this location)	Indeterminate	Ineligible	Not Evaluated by SHPO
BY00692	NN	Habitation (prehistoric), Prehistoric midden(s), Artifact scatter-low density (< 2 per square meter)	Weeden Island, A.D. 450-1000	Not Evaluated by Recorder	Ineligible for NRHP
BY01692	TY-100-9-A	Land-terrestrial	Twentieth century American, 1900-present, World War II & Aftermath 1941-1950	Insufficient Information	Insufficient Information
BY01350	Two Palms Homestead	Building remains, Subsurface features are present, Homestead, Land-terrestrial, Historic refuse/dump, Artifact scatter-low density (< 2 per square meter)	Twentieth century American, 1900-present	Ineligible for NRHP	Ineligible for NRHP
BY01386	TIM 3-A	Campsite (prehistoric), Subsurface features are present, Land-terrestrial, Prehistoric shell	Twentieth century American, 1900-present, Fort Walton, A.D. 1000-1500, Weeden Island, A.D. 450-1000	Insufficient Information	Insufficient Information

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Site Number	Site Name	Site Type	Cultural/Temporal Association	Survey Recommendation	SHPO Recommendation
		midden			
BY01387	TIM 3-B	Subsurface features are present, Homestead, Land-terrestrial	Twentieth century American, 1900-present, Prehistoric	Insufficient Information	Insufficient Information
BY01388	TIM 4-B	Subsurface features are present, Land-terrestrial, Artifact scatter- low density (< 2 per square meter)	Twentieth century American, 1900-present, Weeden Island, A.D. 450-1000	Ineligible for NRHP	Ineligible for NRHP
BY01496	Wet Dune Midden	Specialized site for procurement of raw materials, Land-terrestrial, Prehistoric midden(s)	Ft. Walton, A.D. 1000-1500, Weeden Island II	Insufficient Information	Not Evaluated by SHPO
BY01763	TY-113 A; Tyndall AFB Jeep Range 7	Land-terrestrial	Nineteenth century American, 1821-1899, Twentieth century American, 1900-present, Weeden Island, A.D. 450-1000	Insufficient Information	Insufficient Information
BY01765	TY-113-E	Subsurface features are present, Homestead, Land-terrestrial, Historic well	Twentieth century American, 1900-present	Insufficient Information	Insufficient Information
BY01767	TY112-B, TY112-C	Land-terrestrial	Deptford, 700 B.C.-300 B.C., Prehistoric lacking pottery, Prehistoric with pottery	Insufficient Information	Insufficient Information
BY01768	TY-113-I/J	Land-terrestrial	Fort Walton, A.D. 1000-1500	Insufficient Information	Insufficient Information
BY01780	TY-111-B	Land-terrestrial	Weeden Island, A.D. 450-1000	Ineligible for NRHP	Ineligible for NRHP
BY01781	TY-111-C	Land-terrestrial	Nineteenth century American, 1821-1899, Twentieth century American, 1900-present, Weeden Island, A.D. 450-1000	Ineligible for NRHP	Ineligible for NRHP
BY01782	TY-111-D/E	Land-terrestrial, Prehistoric shell midden	American, 1821-present, Weeden Island, A.D. 450-1000	Not Evaluated by Recorder	Ineligible for NRHP
BY01808	FS-7	Land-terrestrial, Turpentine camp	Twentieth century American, 1900-present, Prehistoric	Ineligible for NRHP	Ineligible for NRHP
BY01947	TY-124-HSS-01	Building remains, Land-terrestrial	Twentieth century American, 1900-present	Eligible for NRHP	Insufficient Information

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Site Number	Site Name	Site Type	Cultural/Temporal Association	Survey Recommendation	SHPO Recommendation
BY01948	TY-124-HSS-02	Building remains, Land-terrestrial	Twentieth century American, 1900-present	Eligible for NRHP	Insufficient Information
BY01949	TY-124 Gunnery Range Remnant	Historic earthworks, Land-terrestrial	Twentieth century American, 1900-present	Eligible for NRHP	Insufficient Information
BY01958	TY 131-01	Campsite (prehistoric), Land-terrestrial	Archaic, 8500 B.C.-1000 B.C., Prehistoric lacking pottery	Ineligible for NRHP	Ineligible for NRHP
BY02278	TY-141 N	Land-terrestrial	Twentieth century American, 1900-present	Insufficient Information	Insufficient Information
BY02299	TY-144-E	Land-terrestrial	Weeden Island, A.D. 450-1000	Ineligible for NRHP	Ineligible for NRHP
BY02300	TY-144-F	Land-terrestrial	Nineteenth century American, 1821-1899, Twentieth century American, 1900-present	Insufficient Information	Insufficient Information
BY02301	TY-144-G	Building remains, Land-terrestrial	Twentieth century American, 1900-present	Insufficient Information	Insufficient Information
BY02302	TY-144-H	Building remains, Land-terrestrial	Twentieth century American, 1900-present	Insufficient Information	Insufficient Information
BY02377	TY-155 C	Land-terrestrial	Twentieth century American, 1900-present	Ineligible for NRHP	Ineligible for NRHP
BY02378	TY-155 F	Campsite (prehistoric), Habitation (prehistoric), Land-terrestrial, Prehistoric shell midden, Historic well	Twentieth century American, 1900-present, Fort Walton, A.D. 1000- 1500, Mississippian, Weeden Island, A.D. 450-1000	Insufficient Information	Insufficient Information
BY02379	TY-155 R	Campsite (prehistoric), Land-terrestrial, Prehistoric shell midden	Fort Walton, A.D. 1000-1500, Mississippian, Santa Rosa-Swift Creek	Insufficient Information	Insufficient Information

Note: Land-terrestrial = located on land. Source: Knudsen et al., 1979; Campbell and Thomas, 1985; Bartlett et al., 2015.

3.9.1.3 Current Investigation

An intensive Phase I archaeological survey was conducted in support of this EA to assess effects to cultural resources in areas that had not previously been surveyed. The survey was conducted in accordance with the guidelines of the FDHR, Cultural Resource Management Standards and Operational Manual (FDHR, 2003). The intensive Phase I survey included pedestrian surface inspection supplemented with systematic shovel testing along transects. The initial research design and work plan for the investigation planned to survey the project areas at a high probability intensity level and included

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

survey transects spaced 25 meters apart with shovel tests excavated at 25-meter intervals along transects. Preliminary background research revealed that the USDA Natural Resources Conservation Service Web Soil Survey characterized the soils in the Flightline Area and Munitions Areas as consisting predominantly of Urban Land and Arents, both of which are highly disturbed soil types produced by human induced cutting, filling, and land leveling, which are not conducive to finding intact archaeological deposits. As a contingency plan for areas in which it was determined that modern construction and disturbance had destroyed the context of deposits to the depth reached by shovel testing (1.0 meter), the survey intensity was reduced to medium (50-meter transect/shovel test intervals) or low probability (100-meter transect/shovel test intervals). All exposed areas were carefully examined for artifacts. Additional judgmental subsurface excavations were placed in those areas considered to be likely site locations. All shovel tests were 50 centimeters (19.69 inches) in diameter and dug in arbitrary 10-centimeter (3.94-inch) stratigraphic levels. All shovel tests were dug to a minimum of 1.0 meter (3.3 feet) below surface unless digging is inhibited by groundwater levels. All excavated soil were screened through 6.34-millimeter (0.25-inch) hardware cloth mounted in portable wooden frames. All shovel tests throughout the survey areas were negative for cultural material.

As previously described, consultations on the buildings to be demolished as part of the recovery effort were initiated prior to October 2019 (**Appendix B**). Throughout this process, the SHPO concurred with the Air Force findings of no adverse effect on a majority of buildings to be demolished. As described in **Section 1.7.1**, SHPO was again consulted to review the Draft EA and responded on 13 February and 13 March of 2020 with requests for additional information, which were responded to on 26 February of 2020. As of 27 March 2020, SHPO has indicated that requested adjustments to the Draft EA and additional information provided are acceptable and they have no further concerns on the EA.

Also as of 27 March 2020, the SHPO separately issued concurrence that the Proposed Actions would present no adverse effect on buildings proposed to be demolished, with the exception of Building 703. The Air Force must fully resolve all adverse effects on this structure with the SHPO prior to undertaking any demolition action on it. Post-resolution, the Air Force would be required to integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions. Within the concurrence letter, the SHPO also requested that an FMSF form documenting Buildings 3160 and 2894 be prepared and submitted for their records.

3.10 HAZARDOUS MATERIALS/WASTE AND SOLID WASTE

3.10.1 HAZARDOUS MATERIALS

Hazardous materials have been declared hazardous through Federal listings including: Extremely Hazardous Substances listed in Appendix A of 40 CFR 355, *Emergency Planning and Notification*; those listed as hazardous if released, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 40 CFR 302.4, *Designation of Hazardous Substances*; and by definition of hazardous chemicals by the OSHA in 29 CFR 1910.1200, *Hazard Communication*. Hazardous materials are defined in AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, to include all items covered under the Emergency Planning and Community Right-to Know Act or other applicable host nation, Federal, state, or local tracking or reporting requirements; all items covered by the OSHA under 29 CFR 1910.1200, or 29 CFR 1910.1450, *Occupational Exposure to Hazardous Chemicals in*

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Laboratories; and Class I or Class II Ozone Depleting Substances. Hazardous materials used at the various buildings to be demolished or constructed include petroleum, oil, and lubricants (POL), paints, cleaning agents, and pesticides.

3.10.2 HAZARDOUS WASTE

Hazardous waste is any solid, liquid, or contained gas waste that is dangerous or potentially harmful to human health or the environment. Hazardous wastes are classified under the Resource Conservation and Recovery Act (RCRA) in 40 CFR 261, *Identification and Listing of Hazardous Waste*, as either characteristic wastes or listed wastes. Characteristic hazardous wastes exhibit one or more of the following traits: ignitability, reactivity, corrosivity, or toxicity. Listed hazardous wastes are wastes specifically listed as being hazardous and are from either specific sources, non-specific sources, or discarded chemical products.

The Tyndall AFB HWMP (Air Force, 2019i) provides guidance on the proper handling and disposal of hazardous waste, including spill contingency and response requirements, at Tyndall AFB. Procedures and responsibilities for responding to a hazardous waste spill or other incidents are also addressed in the Tyndall AFB Spill Prevention, Control, and Countermeasure (SPCC) Plan (Air Force, 2016c). The 325 CES/CEIEC has primary responsibility for the management of hazardous waste at Tyndall AFB.

Tyndall AFB is classified as a Large Quantity Generator of hazardous waste. Hazardous wastes at the Tyndall AFB are controlled and managed from the point of generation to the point of ultimate disposal. Wastes are temporarily stored at designated Initial Accumulation Points (IAPs) at work locations. Once the storage limit is reached, the wastes are transferred to the 90-Day Hazardous Waste Accumulation Site (HWAS) (Building 6011). Within 90 days, the wastes are transported off-base and disposed of in accordance with applicable regulations.

3.10.3 TOXIC SUBSTANCES

A toxic substance is a substance that when ingested or absorbed is harmful or fatal to living organisms. As discussed previously, toxicity is an attribute of some hazardous waste. Through the Toxic Substances Control Act, the USEPA regulates toxic substances such as asbestos, lead-based paint (LBP), polychlorinated biphenyls (PCBs), and radon. Asbestos-containing materials (ACM) at Tyndall AFB are managed in accordance with the guidance provided in the 325 FW Asbestos Management and Operations Plan (Air Force, 2018a). LBP and PCBs are managed at the Installation in accordance with all applicable regulations. Tyndall AFB is located in an area that has low radon levels; indoor radon accumulation has been determined to not be a concern at the Installation. Surveys for ACM and LBP have been completed on 42 structures proposed for demolition and ACM was detected in 38 of these. The other four buildings were reported as non-detected for ACM. LBP was reported in eight structures and only two were reported as non-detected for LBP. The remaining structures have not been surveyed or there has only been a limited survey completed for ACM and LBP. Structures constructed after 1985 would be unlikely to contain ACM or LBP. As standard practice, all structures proposed to be demolished or modified at Tyndall AFB are treated as potentially containing ACM and LBP, unless surveys are completed and no ACM or LBP are found. No potential sources of PCBs are expected to exist in any of the structures to be

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

demolished. **Appendix A** includes a summary of buildings proposed for demolition and the status of ACM and LBP surveys and presence within the structures.

Most, if not all, of the buildings likely were treated to prevent termite infestations. These treatments typically involve pesticides injected into the soil surrounding the buildings. Consequently, soil contamination is likely surrounding each of the buildings proposed for demolition.

3.10.4 SOLID WASTE

Solid wastes are those substances defined in 40 CFR 261.2. Pursuant to Subtitle D of RCRA and its amendments, Federal regulations and guidance address solid waste collection and storage and its subsequent burning, use as a fuel, or landfilling. AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, provides guidance for Air Force installations to develop solid waste management plans that ensure regulatory compliance (Air Force, 2020). Non-hazardous solid waste generated at Tyndall AFB is managed in compliance with the Tyndall AFB ISWMP (Air Force, 2019k). Non-hazardous solid waste is properly collected, handled, managed, transported, and disposed off-base by a contractor. The 325 CES/CEIEC has primary responsibility for the management of non-hazardous solid waste at Tyndall AFB.

3.10.5 ENVIRONMENTAL RESTORATION PROGRAM

The IRP was developed by the DoD to identify, characterize, and remediate contamination from past hazardous waste disposal operations and hazardous materials spills at DoD facilities. Sites on DoD property suspected to be contaminated from past munitions use are investigated and cleaned up under the Military Munitions Response Program (MMRP). Together, the IRP and MMRP make up the DoD's current ERP. Depending on the circumstances, ERP sites are investigated and cleaned up in accordance with the CERCLA or RCRA, or an integrated approach based on both laws. The Air Force currently addresses MMRP sites under CERCLA. In 1997, the USEPA placed Tyndall AFB on the Superfund program's National Priorities List. USEPA, Air Force and FDEP signed an Interagency Agreement known as a Federal Facility Agreement (FFA) on September 20, 2013 to guide the cleanup of the base. These formal agreements are site cleanup plans that ensure coordination of work priorities and establish enforceable schedules for cleanup activities for the life of the project. A total of 38 operable units are listed on the EPA website (USEPA, 2019d).

AFI 32-7020, *The Environmental Restoration Program*, provides guidance and procedures for executing the Air Force ERP within the U.S. The Tyndall AFB ERP includes sites from the IRP and the MMRP, both of which are funded through the Defense Environmental Restoration Account to fulfill the requirements of AFI 32-7020.

Investigation and cleanup activity areas at Tyndall AFB include spill sites, former fire training areas, former landfills, storage tank sites, areas where munitions were used, and SW management units. Sites are at varying stages of investigation, cleanup, and closeout. Outlined below are typical activities that are undertaken for each site at Tyndall AFB during investigation, cleanup and closeout (Tyndall AFB, 2019c).

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Remedial Investigation (RI): The RI characterizes the site contamination from any spill, leak or disposal. The RI addresses three aspects of a site. First, it identifies the type of pollutant or pollutants at or near a site and migration potential to other areas. Second, it assesses the degree of impact present. Third, it characterizes the actual and potential risks to human health and the environment. Normally, a major part of the RI is the Baseline Risk Assessment (BRA). The BRA details the ways in which site contaminants may affect human and ecological health.

Feasibility Study (FS): The FS compares several different ways to cleanup each site. The potential remedies are developed and screened for effectiveness, implementability, and cost. The remaining alternatives are further evaluated in the “Detailed Analysis of Alternatives.” The FS process involves identifying potential treatment technologies, screening technologies, assembling technologies into alternatives, screening alternatives, identifying action specific to Applicable or Relevant and Appropriate Requirements (ARARs) and performing a detailed analysis of alternatives. Assessment and comparison of technologies are based on the USEPA’s nine evaluation criteria. Technologies shall be assessed:

- a) to determine whether they can adequately protect human health and the environment;
- b) to determine whether they attain with ARARs under Federal and State environmental laws;
- c) for the long-term effectiveness & permanence they afford, along with the degree of certainty;
- d) to the degree to which employ recycling or treatment that reduces toxicity, mobility or volume;
- e) for short term effectiveness;
- f) for the ease or difficulty of implementing;
- g) for costs;
- h) for Federal and State’s acceptance; and
- i) for community acceptance

Remedial Action (RA): The RA is usually broken into several phases: the actual construction of remedial systems and the execution or operations of the selected remedy to clean up the site .At more complex sites, the RA process is often further divided into several construction/operation segments to address different media (soil, groundwater, sediment, surface water, and air) contaminants. If the system operation will entail several years of operation this will be referred to as long-term operation (LTO).

Remedy Selection Process, Proposed Plan/Record of Decision (ROD): Based on the FS, an agreement with the USEPA, the FDEP and other regulators is sought in order to develop a cleanup strategy and select the best remedy using the nine selection criteria. A PP is prepared describing the preferred cleanup method or preferred remedy alternative. The PP also summarizes other alternatives for the site, including a no action alternative. The PP is then presented to the public for review and comment. The public can submit written and oral comments on all remedies during a 30-day comment period. During this comment period, the Air Force will answer questions from the public on the PP. The Air Force will also provide the opportunity for a public meeting to explain the remedy and solicit oral and written comments. After the PP public comment period ends, the Air Force prepares a ROD. This document explains the selected remedy for a particular site or sites. The ROD considers public comments on the PP and community concerns and addresses any public comments received during the PP public comment period. After the ROD is signed by the Air Force and regulatory agencies, a public notice is published in a local newspaper and the ROD is made available to the public for inspection.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

IRP sites which overlap with the EA Proposed Actions are summarized on **Table 3.10-1** in terms of site type, site description and phase of investigation/remediation as described above. Refer to **Figures 1.4-1** through **1.4-7** for depictions of the Proposed Action project footprints in relation to the IRP sites. Potential impacts to these sites due to the Proposed Actions are further discussed in **Section 4.9.1**.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 3.10-1 IRP SITES WITHIN OR ADJACENT TO EA PROPOSED ACTIONS

Project Category	Project	IRP Site ID	Site Name	Site Type	Phase/ Status	Site Description
2000 Area Projects	2000-1b	LF010	Capehart Marina Rubble Storage	Storage	ROD Approved	This 0.5-acre site has been used since about 1975 for the aboveground storage of concrete rubble. The Air Force and the USEPA, in consultation with the FDEP, determined that no remedial action is required. Given the approval of a No Action determination by the regulatory agencies, the Air Force prepared a No Action ROD for the site and has received ROD approval. The site has no known or suspected contaminants.
		TU202	Beacon Beach Marina	Underground Storage Tank	Memorandum of Decision/ SCRO	This 1.22-acre site is where 400 gallons of gasoline leaked from the underground fuel line in 1992. The Beacon Beach Marina is the base recreational boat launch and storage facility that includes a boat launch ramp and boat fueling system. The original site layout for the fuel dispenser utilized three USTs north of the dispenser. This system was later replaced with a 5,000-gallon aboveground storage tank (AST) with concrete secondary containment. An underground fuel line connected the AST to the dispenser. In 1992, a release of 400 gallons of gasoline was reported from the underground piping system. The AST and connecting fuel line were removed along with the AST containment area. In addition, the three USTs from the older fueling system were also removed. A new double-walled AST fuel tank system was subsequently constructed adjacent to the fuel dispenser. The Tyndall AFB IRP team, consisting of members from the FDEP, the Air Force, the USEPA, and various environmental consulting firms, have determined that the site has met No Further Action (NFA) conditions in accordance with Risk Management Option Level I per Chapter 62-780.680 F.A.C. The Air Force submitted the Draft Memorandum of Decision for NFA/SRCR to FDEP on 22 January 2019. Once the SRCO has been issued, the existing groundwater monitoring wells will be abandoned according to Florida requirements. Groundwater sampling results revealed benzene in exceedance of Maximum Contaminant Levels and Groundwater Cleanup Target Levels (GCTL) in December 1997. However, for each subsequent monitoring event, benzene was not detected above the laboratory reporting limit.
	2000-1c	LF003	Beacon Beach Road Landfill	Landfill	Site Closure	This 5.3-acre site reportedly received household and mess hall wastes from 1943 to 1948 as a general refuse landfill. Source materials included glass bottles, plastic, wire, and partially-corroded remains of metal containers and equipment parts. Five carcinogenic polycyclic aromatic hydrocarbons (PAH) and arsenic were historic Constituents of Potential Concern (COPC). However, the excavation and off-site disposal of buried waste, and associated soil was completed in August 2018, and the base has obtained official site closure from the regulatory agencies.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Phase/ Status	Site Description
8500 Area Projects	8500-1	SR169	Jeep Range	Small Arms Range	RI/FS	This 1,594-acre site consists of twelve individual training ranges constructed in the early 1940s for the Flexible Gunnery School stationed at Tyndall AFB. The Jeep Ranges were operational until December 1945 when the Flexible Gunnery School was closed. Munitions associated with the Site SR169 included .22, .30, and .50 caliber small arms rounds. The rounds were fired from stationary machine guns at passing targets. Sampling conducted to date has revealed lead in two sediment and surface water samples and one groundwater sample.
	F-02	TU205	Building 239	Underground Storage Tank	RI/FS	This 8-acre site includes a number of former POL and oil/water separator (OWS) sites situated in close proximity to Building 239, as well as a chlorinated hydrocarbon plume that was identified in previous investigations. The facility historically has been used as a jet engine test facility. The site study area incorporates multiple industrial features, some of which have been in operation since the 1960s. The site was moved from the FDEP program to CERCLA in 2010. Site contaminants include benzene, PAHs, VOCs, and chlorinated solvents.
	F-03	N/A	BLDG 451 Former PCP Transformer Storage	Transformer Storage	RI Scoping	This 1,482-square-foot cinder block shed with a concrete floor once stored out of service transformers containing PCB contaminated oil prior to being shipped off-site. Inspections have revealed the floor to be in good condition, with no suspected contamination within the building footprint.
		N/A	BLDG 460 OWS	Oil/Water Separator	RI Scoping	This former 300-gallon OWS had received oily waters from the maintenance operations on the equipment until the unit was taken out of service in March 1994. The OWS passed a tightness test in 2001, prior to being abandoned in place and backfilled. No leaks were reported or are suspected.
		N/A	BLDG 462 WAA	Waste Accumulation Area	RI Scoping	This 7,121-square-foot building reportedly accumulated aerosol cans and universal defined waste items in a 15-gallon drum and a 1-gallon drum. There is no observed or suspected site contamination.
F-04, F-06, F-09	OW217	Building 264/280	Oil/Water Separator	RI/FS	This 25-acre site combines the potential for groundwater impacts reported at Building 280 (Hangar 4) to be associated with the groundwater plume identified at former Building 264. Hangar 4 was constructed in 1955 and is currently used for small-scale aircraft maintenance and training support for Flightline maintenance crews. Former Building 264 was built in 1959 and was used for maintenance and repair of aerospace ground equipment until it was demolished in the early 2000s along with two exterior wash pads and associated OWSs. COPCs at the site are 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-dichlorobenzene; 2-chlorotoluene; benzene; dichloropropane; ethylbenzene; isopropylbenzene; m,p-xylene, naphthalene; o-xylene; perchloroethylene (PCE); toluene; tetrachloroethylene (TCE);	

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Phase/ Status	Site Description
						benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; chrysene; dibenzo(a,h)anthracene; and total recoverable petroleum hydrocarbons (TRPH). The site was transferred to the CERCLA framework in 2010 due to the presence of chlorinated solvents.
	F-07, F-08, F-09	SS026	Vehicle Maintenance Area	Spill Site Area	RI/FS	This 54-acre study area incorporate multiple industrial and administrative facilities, some of which date back to the 1940s. Site SS026 is the Vehicle Maintenance Area which is comprised of four buildings (Buildings 560, 561, 571, and 559) that perform a variety of general repair, bodywork, painting, washing, and refueling functions. Site SS026 also contains a number of active and former OWS, underground storage tanks (UST), and AST which are and have been used for storage of petroleum products and waste fluids related to the activities performed in the Vehicle Maintenance Area. VOCs, including TCE and benzene are the COPCs present in the highest concentrations and/or most widely distributed areas. Based on the review of previous investigations and other historical documents, there is a concern that the site was not fully characterized. In 2015 additional investigative sampling was conducted to gather updated contaminant levels and identify potential data gaps. Further investigation will be required and any remedial activities necessary will be addressed under a future contract.
	F-10	N/A	Munitions Storage Area	Munitions	Active	This active MSA, also known as the Ammo Area, is located northeast of the Flightline and is used for storage of munitions.
Support Area Projects	SA-05, SA-09, SA-10	N/A	BLDG 934 WAA	Waste Accumulation Area	RI Scoping	This 60-square-foot secondary containment metal bin and 1,000-gallon used oil collection tank are used to accumulate small quantities of waste solvents, paint wastes, and other miscellaneous hazardous wastes (used fuel/oil filters, spent antifreeze, parts wash fluid, oil/fuel absorbent material rags, asbestos brake pads, used batteries, etc.) in the collection tank, a 55-gallon drum, a 15-gallon drum, and a 1-gallon drum. The results of area investigations indicate that no soil or groundwater impacts exist at the site.
Multi Area Projects	M-01	FT023	Former Active Fire Training Area	Fire/Crash Training Area	RI/FS	This 5.2-acre fire training area was used in 1981-1992. The site formerly consisted of a fire training pit, a 10,000-gallon AST, a pump-house, and an OWS and drain field. Fuel (JP-4) stored in an AST was pumped via underground piping to the fire training pit, dispensed onto a surplus or simulated aircraft, ignited, then extinguished for firefighting training purposes, including the application of new fire suppression technologies and chemicals. The site's groundwater has reached FDEP cleanup criteria. Contaminants identified in soil and groundwater were TRPHs, including free-phase product, and POL contaminants of concern including benzene, toluene, ethylbenzene and xylene (BTEX), methyl-tert-butyl ether, and lead.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Phase/ Status	Site Description
						Additional sampling at this site is warranted due to Fire Training history.
		OT004	Southeast Runway Extension Burial Site	Debris Burial	Site Closure	This 18.4-acre site was reported to have been used intermittently from 1945 to 1965 for disposal of used containers, drums, batteries, and parts. The Air Force and the USEPA, in consultation with the FDEP, determined that no remedial action was required. Given the approval of a No Action determination by the regulatory agencies, the Air Force prepared a No Action ROD for the site, which has received regulatory approval. IRP site has been closed by regulatory agencies. No COPCs were detected in soil or groundwater related to the historical activities at the site.
		SS015	POL Area B	Spill Site Area	RI/FS	This 25-acre site was a POL tank farm (fourteen USTs and one AST) from 1941 through 1980. All tanks were removed between 1985 and 1987. Free-phase POL and BTEX may still be present at the site.
		SS026	Vehicle Maintenance Area	Spill Site Area	RI/FS	See description under Flightline Area Projects (F-07).
	M-02	LF003	Beacon Beach Road Landfill	Landfill	Site Closure	See description under 2000 Area Projects (2001-c). IRP site has been closed by regulatory agencies.
		LF012	Highway 98 Burial Site	Debris Burial	Site Closure	This 5.49-acre site was used for burial of rubble and debris from the razing of Magnolia and Tyndall housing during the mid-1960's. The Air Force and the USEPA, in consultation with the FDEP, determined that no remedial action was required. Given the approval of a No Action determination by the regulatory agencies, the Air Force prepared a No Action ROD for the site, which has received regulatory approval. IRP site has been closed by regulatory agencies. There are no known or suspected COPCs at this site.
		OW217	Building 264/280	Oil/Water Separator	RI/FS	See description under Flightline Area Projects (F-04/F-06/F-09).
		SA181	Tower Range	Storage Area	ROD	This 52.6-acre Small Arms Firing Range (skeet range) used for training Army Air Corps turret gunners in the 1940s. During subsequent years, portions of SA181 were also used for pistol, rifle, and miniaturization range training. A ROD is in development to detail remedial actions. Site sediment, surface water, and groundwater require further characterization for nature and extent of lead and other munitions metals and PAHs.
		SR169	Jeep Range	Small Arms Range	RI/FS	See description under 8500 Area Projects (8500-1).
		SR170 A	Tyndall Elementary School	Small Arms Range	RI/FS	The former shooting range is referred to as the Stationary Target Range (SR170A), which consisted of a triangular range road with 30-foot portable towers at the range, operated from 1941 to 1946. Tyndall AFB Gunnery School students rode in the back of trucks and fired either handheld or turret-

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Phase/ Status	Site Description
						mounted 12-gauge shotguns. The Gunnery School students shot at clay targets thrown at various angles from the towers. Lead pellets and clay target debris were distributed across the range during Gunnery School activities. Tyndall Elementary School was constructed on 25 acres of the former Stationary Target Range in 1951. Lead pellets and clay target fragments are known to have been released throughout the property. Lead pellets may pose an unacceptable level of risk if purposely or accidentally ingested by small children. Three removal actions occurred in 2009, 2015 and 2016.
		SS015	POL Area B	Spill Site Area	RI/FS	See description under Multi-Area Projects (M-01).
		SS026	Vehicle Maintenance Area	Spill Site Area	RI/FS	See description under Flightline Area Projects (F-07).
		TU205	Building 239	Underground Storage Tank	RI/FS	See description under Flightline Area Projects (F-02).
	M-03 (within/ adjacent to EA project areas)	OW040 /BLDG 188 WAA	Building 315	Oil Water/Separat or	RI Scoping	This 0.3-acre site consist of a former 10,200-gallon OWS associated with aircraft painting operations that was closed in place in 2001 after passing the tightness test. Initial investigations suggested that VOCs, PAHs, TRPH, and metals could be COPCs. Based on supplemental sampling results, the Air Force recommends No Action for this site. Building 315 was razed in 2018. The site is currently vacant.
		SS015	POL Area B	Spill Site Area	RI/FS	See description under Multi-Area Projects (M-01).
		N/A	BLDG 182 WAA	Waste Accumulation Area	RI Scoping	This former 65-square-foot spill containment building was reportedly accumulated residual sealant, rags with spent solvent, paint pens, silver laden dust and debris from aircraft maintenance, aerosol cans, oil/fuel absorbent material, and universal defined waste items in a 55-gallon drum, a 15-gallon drum, and a 1-gallon drum. Free-phase petroleum products were historically encountered at the site. However, in May 2014, TRPH was the only petroleum constituent reported at concentrations greater than GCTLs. While this WAA is within the foot print of IRP site SS015, Building 182 is being addressed under IRP Site TU204. IRP Site TU204 was transferred to the State Petroleum Program for further investigation on May 2016. Based on the evaluation conducted, the site operational history and the conditions of the site satisfy the CERCLA Petroleum Exclusion Criteria.
		N/A	BLDG 180 WAA	Waste Accumulation Area	RI Scoping	This 65-square-foot spill containment building is reportedly accumulated residual sealant, rags with spent solvent, paint pens, silver laden dust and debris from aircraft maintenance, aerosol cans, oil/fuel absorbent material, and universal defined waste items in a 55-gallon drum, a 15-gallon drum, and a 1-gallon drum.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Phase/Status	Site Description
		TU204	Building 182 Former UST Site	Underground Storage Tank	Deferred to FDEP POL Program	This 0.29-acre site is where soil and groundwater contamination was discovered in the vicinity during the removal of a 2,000-gallon JP-4 UST in 1991. Contamination Assessment activities conducted at the site identified petroleum-contaminated soil and groundwater at concentrations above FDEP Soil Cleanup Target Levels (SCTL) and GCTLs. In addition, free-phase product accumulation was identified in one site monitoring well during sampling events in 1995 and 1997. Free-phase product was not found after 1997. Chlorinated VOCs (i.e., TCE, and vinyl chloride [VC]) were also historically reported in several wells at concentrations exceeding GCTLs; however, they were not reported in site soils and chlorinated VOC concentrations in excess of GCTLs have not been reported during any of the most recent groundwater monitoring events. Based on the evaluations conducted, the site operational history and the conditions of the site satisfy the CERCLA Petroleum Exclusion Criteria.
		N/A	BLDG 258 WAA	Waste Accumulation Area	RI Scoping	This 240-square-foot hazardous waste storage building 257 (outside of building 258) reportedly accumulated part cleaning washer fluid, oil/fuel absorbent material, aerosol cans, paint pens, used oil/fuel filters, universal defined waste items, and residual sealant in a 55-gallon drums. Building 257 is within the footprint of OW217 and included in the RI stage.
		SS026	Vehicle Maintenance Area	Spill Site Area	RI/FS	See description under Flightline Area Projects (F-07).
		N/A	BLDG 559 WAA	Waste Accumulation Area	RI Scoping	This 3,466-square-foot building and a former 40-square-foot area outside the building reportedly accumulated small quantities of waste solvents, paint wastes and other miscellaneous hazardous wastes (rags, asbestos brake pads, used batteries, etc.) in a 55-gallon drums.
		OW217	Building 264/280	Oil/Water Separator	RI/FS	See description under Flightline Area Projects.
		TU205	Building 239	Underground Storage Tank	RI/FS	See description under Flightline Area Projects (F-02).

Source: Tyndall AFB, 2019c

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

3.11 SOCIOECONOMICS

Socioeconomics analyses involve economic and social elements such as population levels, workforce and consumer activities. Factors that characterize the socioeconomic environment represent a composite of several interrelated and nonrelated attributes. Indicators of economic conditions for a geographic area can include demographics, median household income, unemployment rates, employment, and housing data. Data on employment identify employment by industry or trade and unemployment trends. Data on personal income in a region are used to compare the before and after effects of any jobs created or lost as a result of a Proposed Actions. 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.

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 Actions would likely occur and where most consequences for local jurisdictions would be expected. Tyndall AFB is located 12 miles east of Panama City in Bay County, Florida. The ROI for the analysis of socioeconomic impacts for the Proposed Actions is the census tracts including and surrounding Tyndall AFB, which are tracts 5, 6, 7, 9, 10, 26.07, 19, and 20. This ROI illustrates socioeconomic characteristics for the area nearest to Tyndall AFB and the geographic area where most impacts from the Proposed Actions would be expected to occur. Additionally, data for Panama City, Bay County and the state of Florida are provided for further information and areas of comparison. Information pertaining to the existing social and economic characteristics of the ROI was gathered from data published by the U.S. Census Bureau. Specifically, the most recent published data used were the 2013-2017 American Community Survey (ACS) Five-Year Estimates.

3.11.1 POPULATION

Based on data from the U.S. Census Bureau, the estimated population of the ROI in 2017 was 15,723, which represents a 23.2 percent increase since 2000. The population of Bay County increased by 17.7 percent since 2000, while Panama City only increased by less than 1 percent. The state of Florida increased at a percentage similar to the ROI (21.2 percent) (U.S. Census Bureau, 2000a; U.S. Census Bureau, 2000b; U.S. Census Bureau, 2010a; U.S. Census Bureau, 2010b; U.S. Census Bureau, 2017a). The workforce population of Tyndall AFB in 2017 was 26,598, including military and civilian personnel and dependents as well as military retirees and their dependents. Total employment at Tyndall AFB consisted of 5,657 personnel, including 3,644 active duty military personnel, 1,304 appropriated fund civilians, and 709 non-appropriated fund contract civilians and private business employees (Air Force, 2017a).

3.11.2 ECONOMIC ACTIVITY (EMPLOYMENT AND EARNINGS)

The total number of employed people in the civilian labor force in the ROI in 2017 was 5,870. The industry employing the highest percentage of the civilian labor force in the ROI, Panama City, Bay

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

County, and the state of Florida was the educational services/health care and social assistance industry. Per capita income in 2017 the ROI was \$28,102. It is similar in the comparative regions. As of August 2019, the unemployment rate in Bay County (not seasonally adjusted), Panama City (not seasonally adjusted), and Florida (seasonally adjusted) was 3.5 percent, 3.6 percent, and 3.3 percent, respectively (U.S. Department of Labor, 2019).

The total economic impact of Tyndall AFB during Fiscal Year 2017 was approximately \$596 million. This includes payroll for military and civilian personnel of more than \$370 million, creation of 1,908 jobs with an estimated value of approximately \$75 million, and local expenditures of approximately \$150 million (Air Force, 2017a).

3.11.3 HOUSING

Three housing options are available for Tyndall AFB personnel, including privatized military family housing, unaccompanied housing, and community housing (Air Force, 2019a). The U.S. Census Bureau estimates that in 2017, there were 101,437 housing units in Bay County, of which 32,764 were unoccupied resulting in a 32.3 percent vacancy rate. Owner-occupied units in Bay County account for 62.4 percent of the housing units, while the remaining 37.6 percent were renter-occupied units. In Panama City, there were 18,053 housing units, of which 3,159 were unoccupied resulting in a 17.5 percent vacancy rate. The 2017 census estimate for the ROI is 10,114 housing units, of which approximately 427 were unoccupied, resulting in a 4.2 percent vacancy rate. Owner-occupied units account for 88.8 percent of the housing units in the ROI, while the remaining 11.2 percent are renter occupied (U.S. Census Bureau, 2017g; U.S. Census Bureau, 2017h; U.S. Census Bureau, 2017i).

3.11.4 EDUCATION

Tyndall AFB is located in the Bay District. There are three schools within close proximity to Tyndall AFB. Tyndall Elementary School is a kindergarten through fifth grade school located on the installation approximately one mile from the Main Gate. Everitt Middle School (6th-8th grade) and Rutherford High School (9th-12th grade) are located in Panama City. School Liaison Officers are available at Tyndall AFB that work closely with school district staff to network, educate, and work in partnership with local schools and establish support programs. Bay District Schools is also a member of the Military Child Education Coalition whose mission is to ensure inclusive, quality educational opportunities for all military-connected children affected by mobility, transition, deployments and family separation (Bay District Schools, 2019).

3.11.5 INSTALLATION AND PUBLIC SERVICES

Law enforcement services (police) at Tyndall AFB are provided by the Tyndall Community Police, and fire protection and emergency services through the Tyndall AFB Fire and Emergency Services and the Ambulance Services Department. The 325th Medical Group (MDG) operates as an outpatient medical facility with family practice, pediatrics, dental, flight medicine and women's health clinics. Services provided at the clinics include radiology and a clinical laboratory. The group also offers a clinical pharmacy, nutritional medicine programs, and base support services such as public health, bioenvironmental engineering and aerospace physiology.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Public services in the ROI consist of law enforcement, fire protection, emergency medical services, and medical services. The Bay County Sheriff's Office provides law enforcement services for the County and has civil and patrol divisions. Other law enforcement agencies in the area include the Parker Police Department, Panama City Police Department, and Panama City Beach Police Department. Bay County Fire Services occupies 13 stations in unincorporated Bay County. Bay County Emergency Medical Services operates several Advanced Life Support Paramedic Mobile Intensive Care units from locations throughout Bay County and works closely with the Fire and Law Enforcement agencies who respond as First Responders.

The closest emergency room to Tyndall AFB and the ROI is at the Gulf Coast Regional Medical Center located approximately 12 miles from the installation in Panama City.

3.12 ENVIRONMENTAL JUSTICE

Analysis of environmental justice evaluates impacts on environmental justice populations (i.e., minority and low-income populations) and is directed by EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The Air Force *Guide for Environmental Justice Analysis under the Environmental Impact Analysis Process (EIAP)* (Air Force, 2014a) also provides guidance on how to fulfill the requirement for environmental justice analysis. 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 actions result in disproportionately high and adverse environmental and health impacts on low-income or minority populations. Additionally, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs that Federal agencies identify and assess environmental health and safety risks resulting from Federal actions that may disproportionately affect children.

The ROI for environmental justice is the same as that described for socioeconomic effects (**Section 3.11**).

3.12.1 MINORITY AND LOW-INCOME POPULATIONS

Minority population levels within the ROI are lower than Bay County, Panama City, Florida, and those found throughout the U.S. Within the ROI, the population in 2017 reporting to be a race other than white was 16.1 percent of the total, which is substantially lower than the 27.6 percent for Panama City, 24.3 percent for Florida, and 27.0 percent for the U.S., but is similar to 18.2 percent for Bay County (U.S. Census Bureau, 2017a; U.S. Census Bureau, 2017j). The Hispanic or Latino population in the ROI (8.2 percent) is substantially lower than the population in the Florida (24.7 percent) and the U.S. (17.6 percent) but is statistically similar to that of Panama City (8.5 percent) and Bay County (6.0 percent). The percentage of individuals below the poverty level is not available for the ROI; however, in Panama City (21.6 percent), it is slightly higher than that of Bay County (15.4 percent), Florida (15.5 percent), and the

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

U.S. (14.6 percent). The frequency of families below the poverty level in Panama City is 16.5 percent, which is higher than that of Bay County (10.7 percent), Florida (11.1 percent), and the U.S. (10.5 percent). This trend is also reflected in the lower per capita income and median household income in Panama City relative to Bay County, Florida and the U.S. as a whole. The per capita income and median household income in the ROI similar to that of Bay County, Florida and the U.S. (U.S. Census Bureau, 2017e; U.S. Census Bureau, 2017k).

3.12.2 CHILDREN

In 2017, the number of children under the age of 18 living in the ROI was 3,474. The number of children present within the ROI is generally consistent with the distribution averages of Panama City, Bay County, Florida and the U.S.

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.0 ENVIRONMENTAL CONSEQUENCES

This EA provides a detailed analysis of the potential direct, indirect, and cumulative impacts that would result from implementation of the Proposed Actions or No Action Alternative. As discussed in **Sections 2.3 and 3.1**, of this EA and consistent with 32 CFR 989.8(c), alternatives not fully achieving established selection standards were not retained for detailed analysis. Direct impacts are those effects that are caused by the action and occur at the same time and place (40 CFR Section 1508.8[a]). Indirect impacts are those effects that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR Section 1508.8[b]). Cumulative impacts are those that would result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. As appropriate, impacts are further discussed as being temporary, short-term, or long-term. For purposes of this EA, temporary effects are defined as those that would last for the duration of the construction period; short-term impacts would last from the completion of construction to three years. Long-term impacts are defined as those impacts that would occur from three to 10 years after construction, while permanent impacts indicate an irretrievable loss or alteration.

In an EA, the magnitude of the impact is considered regardless of whether the impact is adverse or beneficial. Determination of the significance of the impact, as described in 40 CFR 1508.27, requires considerations of both context and intensity. Context considers the geographic extent of the potential impact (local, regional, or greater extent) while intensity considers the severity of the impact. The following terms are used to describe the magnitude of impacts in this EA:

- No Effect: The action would not cause a detectable change.
- Negligible: The impact would be at the lowest level of detection; the impact would not be significant.
- Minor: The impact would be slight but detectable; the impact would not be significant.
- Moderate: The impact would be readily apparent; the impact would not be significant.
- Major: The impact would be clearly adverse or beneficial; the impact has the potential to be significant. The significance of adverse and beneficial impacts is subject to interpretation and should be determined based on the final proposal. In cases of adverse impacts, the impact may be reduced to less than significant by mitigation, design features, and/or other measures that may be taken

4.1 AIR QUALITY AND CLIMATE CHANGE

This section identifies and discloses potential air quality impacts from criteria pollutant and GHG emissions associated with the Proposed Actions. The air quality impact analysis follows the EIAP Air Quality Guidelines (Solutio Environmental, 2017) for criteria pollutants, and GHG emissions. Impacts to air quality would be considered significant if the Proposed Actions were to:

- Cause pollutant concentrations to exceed one or more of the NAAQS for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

The majority of air emissions associated with the Proposed Actions would be temporary in nature (limited to the duration of demolition and construction activities) and would be caused by construction equipment and vehicle operation, asphalt paving, and dust generated from demolition and disturbance on unpaved areas. LTO emissions related to the Proposed Actions would result from fuel combustion by newly-installed emergency generators and space heating equipment. These emissions are expected to be small and generally not represent an increase from the current conditions.

The Air Force's Air Conformity Applicability Model (ACAM) was used to analyze the potential air quality impacts associated with the Proposed Actions, as described above, in accordance with the AFMAN 32-7002, the EIAP, and the General Conformity Rule (40 CFR 93 Subpart B).

The Proposed Actions would not result in significant impacts to air quality. The following subsections describe the non-significant effects on air quality that would result from the Proposed Actions.

4.1.1 PROPOSED ACTIONS

4.1.1.1 Operational Activities

The Proposed Actions would not result in any new operational activities (i.e., new missions) or increased operational levels (i.e., additional personnel). Operational levels of and resulting emissions from existing permitted stationary emissions sources discussed in **Section 3.2.2.3** and depicted in **Table 3.2-3** are not expected to change considerably with the implementation of the Proposed Actions. New heating equipment and emergency generators installed in the new buildings would replace equipment of similar sizes and capacities in hurricane-damaged areas, and therefore, emissions from these sources would be unlikely to increase. However, the following analysis conservatively includes "steady state" (operational) emissions from these sources to demonstrate their potential impact on air quality.

4.1.1.2 Demolition and Construction Activities

Demolition and construction activities associated with the Proposed Actions would include demolishing existing buildings, structures, and utilities; site clearing and grading; trenching and excavation; paving; constructing new buildings and associated utilities; and application of architectural coatings. Construction period emissions depend on expected material quantities and equipment/vehicle utilization requirements for each project component. Contractors may be required to obtain appropriate permits and comply with all permit provisions for certain types of equipment and temporary facilities (e.g. portable crushers and batch plants).

Demolition and construction activities associated with the Proposed Actions would result in the following short-term air quality impacts:

- Fugitive dust would be generated by demolition and construction operations.
- Emissions of criteria pollutants (VOC and NO_x [as precursors of O₃], CO, PM₁₀, and PM_{2.5} [including its precursor SO₂], and GHG emissions) would result from demolition and construction activities such as:
 - Use of diesel-powered and gas-powered demolition and construction equipment,

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Evaporation of architectural coatings and paving asphalt, and
- Construction workers' commutes and haul truck trips.

4.1.1.3 Emissions Results

As mentioned, the operational and construction emissions resulting from the Proposed Actions were calculated using ACAM. These emissions are “netted” on an annual basis. The impact analysis must consider the greatest annual emissions associated with the Proposed Actions. Since emissions from the Proposed Actions can vary from year-to-year depending on activity, the greatest annual net change in emissions for each pollutant forms the basis of the analysis. The individual pollutant worst-case emission value may occur in a different project year. The total annual emissions during the construction phase of the Proposed Actions are presented in **Tables 4.1-1a** through **4.1-1g** for each year until the action reaches “steady state” (i.e., once the action is fully implemented and operational with no further net change in emissions). See **Appendix E** for the ACAM Record of Air Analysis for the Proposed Actions.

TABLE 4.1-1A 2020 CONSTRUCTION PHASE EMISSIONS

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	0.896	100	No
NO _x	6.901	100	No
CO	4.108	100	No
SO _x	0.017	100	No
PM ₁₀	76.277	100	No
PM _{2.5}	0.279	100	No
Pb	0.000	25	No
NH ₃	0.018	100	No
CO _{2e}	1,820.3	--	--

Notes: CO_{2e} = Carbon Dioxide Equivalent
Source: ACAM, run on 14 October 2019.

TABLE 4.1-1B 2021 CONSTRUCTION PHASE EMISSIONS

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	1.814	100	No
NO _x	10.163	100	No
CO	8.483	100	No
SO _x	0.032	100	No
PM ₁₀	62.225	100	No
PM _{2.5}	0.432	100	No
Pb	0.000	25	No
NH ₃	0.027	100	No
CO _{2e}	2,931.5	--	--

Source: ACAM, run on 14 October 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 4.1-1C 2022 CONSTRUCTION PHASE EMISSIONS

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	4.064	100	No
NO _x	10.159	100	No
CO	9.629	100	No
SO _x	0.058	100	No
PM ₁₀	55.974	100	No
PM _{2.5}	0.461	100	No
Pb	0.000	25	No
NH ₃	0.020	100	No
CO ₂ e	3,380.4	--	--

Source: ACAM, run on 14 October 2019.

TABLE 4.1-1D 2023 CONSTRUCTION PHASE EMISSIONS

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	10.117	100	No
NO _x	12.323	100	No
CO	8.233	100	No
SO _x	7.506	100	No
PM ₁₀	45.288	100	No
PM _{2.5}	0.624	100	No
Pb	0.000	25	No
NH ₃	0.025	100	No
CO ₂ e	5,605.6	--	--

Source: ACAM, run on 14 October 2019.

TABLE 4.1-1E 2024 CONSTRUCTION PHASE EMISSIONS

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	2.068	100	No
NO _x	15.977	100	No
CO	13.052	100	No
SO _x	14.950	100	No
PM ₁₀	1.269	100	No
PM _{2.5}	0.811	100	No
Pb	0.000	25	No
NH ₃	0.017	100	No
CO ₂ e	7,602.5	--	--

Source: ACAM, run on 14 October 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 4.1-1F 2025 CONSTRUCTION PHASE EMISSIONS

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	18.690	100	No
NO _x	15.699	100	No
CO	11.900	100	No
SO _x	14.998	100	No
PM ₁₀	1.387	100	No
PM _{2.5}	0.932	100	No
Pb	0.000	25	No
NH ₃	0.010	100	No
CO _{2e}	9,375.7	--	--

Source: ACAM, run on 14 October 2019.

TABLE 4.1-1G 2026 EMISSIONS (STEADY STATE)

Pollutant	Proposed Actions Emissions (ton/year)	Air Quality Indicator	
		Threshold (ton/year)	Exceedance (Yes or No)
<i>Not in a Regulatory Area</i>			
VOC	0.803	100	No
NO _x	14.635	100	No
CO	8.287	100	No
SO _x	15.083	100	No
PM ₁₀	1.573	100	No
PM _{2.5}	1.122	100	No
Pb	0.000	25	No
NH ₃	0.000	100	No
CO _{2e}	12,750.4	--	--

Source: ACAM, run on 14 October 2019.

4.1.1.4 Clean Air Act General Conformity Rule Applicability

The General Conformity Rule does not apply to the Proposed Actions because Tyndall AFB is located within an area designated in attainment with of all criteria pollutants.

4.1.1.5 Attainment Criteria Pollutant Emissions

Unlike nonattainment or maintenance criteria pollutants, General Conformity *de minimis* levels have not been established for attainment criteria pollutant emissions. However, as outlined in the EIAP Guide, the General Conformity *de minimis* thresholds are used as NEPA significance indicators for air quality in attainment areas. General Conformity *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas. These threshold values would also be a conservative indicator that an action's emissions within an attainment area would also be acceptable. In other words, if the threshold is acceptable in nonattainment areas, it will also be acceptable in attainment areas. For the Proposed Actions, all attainment criteria pollutants are below the significance indicators presented in **Tables 4.1-1a** through **4.1-1g**. Therefore, the potential air quality impact from all criteria pollutants is insignificant.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.1.1.6 Greenhouse Gas Emissions and Climate Change

The estimated increase of GHG emissions associated with construction activities would produce about 9,376 metric tons of carbon dioxide equivalent (CO₂e) in the peak year of construction (2025). For the steady-state (or operational phase) of the Proposed Actions, the newly installed heating equipment and generators is expected to yield no net increase (i.e., 0 ton per year CO₂e) in GHGs. However, for a conservative analysis, assuming that the new equipment did not replace existing equipment, the annual net increase would be approximately 12,750 tons of CO₂e per year.

The change in climate conditions caused by GHGs resulting from the burning of fossil fuels from activities associated with the Proposed Actions is a global effect. Therefore, the disclosure of localized incremental emissions has no weight to impact climate change. Consequently, given the minimal increase predicted for temporary construction and steady state activities, the Proposed Actions would result in an insignificant impact on overall global or U.S. cumulative GHG emissions and global climate change.

Tyndall AFB climate is warm during the summer with high temperatures in the 80s to 90s and moderate during winter when low temperatures tend to be in the 40s to 50s. The annual average precipitation at Tyndall AFB is approximately 61 in with heaviest rainfall occurring during the summer and autumn months (Florida Climate Center, 2019). Proposed new building construction and demolition of damaged structures are not anticipated to be directly affected by global climate change and resulting warmer temperatures and possible sea level rise. Project M-01 (Airfield Drainage) would remove inadequate airfield drainage infrastructure and replace it with appropriately-sized drainage ditches, which would allow the airfield to drain properly and therefore to better respond to future storm events that could result from such potential changes.

4.1.1.7 Mitigation Measures

No mitigation measures would be required.

4.1.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, construction activities and emissions associated with the Proposed Actions would not occur. The hurricane-damaged buildings and their associated utilities would remain in their current locations, and existing building heating equipment and emergency generators would not be demolished and replaced. No construction or demolition activities would occur, and therefore no significant impacts to air quality would occur.

4.2 NOISE

4.2.1 PROPOSED ACTIONS

4.2.1.1 Operational Activities

Based on the information regarding the individual projects, implementation of the Proposed Actions would not result in any aircraft noise related impacts on sensitive noise receptors in the vicinity of Tyndall AFB. Therefore, a quantitative analysis of aircraft operational noise is not included in this EA.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.2.1.2 Demolition and Construction Activities

Construction and demolition activities associated with the Proposed Actions are expected to result in a short-term, negligible to minor, adverse impact on the noise environment at Tyndall AFB. Construction activities would include, but are not limited to: land clearing, grading, and excavation; pavement construction, demolition, and removal; and building construction, demolition, and removal. These activities would involve the use of vehicles, heavy construction equipment, and machinery and would be conducted during the daytime hours of 0700 to 1700. Construction activities would temporarily increase noise levels in the immediate vicinity of the Proposed Action areas; however, because distance rapidly attenuates noise levels, the areas would experience only a minor increase in ambient noise conditions during construction hours. The VAQ is centrally located near large areas of demolition and construction. The VAQ may experience some annoyance due to construction noise; however, this noise will be temporary in nature both in the daily operation of the sites and the length of the project. Of the other NSS, the chapel is closest to a project site at just over 1,100 feet from the nearest construction site; Tyndall Elementary School is approximately 2,300 feet from the nearest project site, the VOQ is approximately 2,500 feet, and the nearest long-term base housing is almost 3,800 feet from the nearest project site. **Table 4.2-1** presents measured noise levels of common construction equipment at 50 feet. The table also provides the attenuation of these sound levels at 500, 1,000 and 1,500 feet. Therefore, implementation of the Proposed Actions would not be expected to result in a significant impact on the noise environment.

TABLE 4.2-1 CONSTRUCTION EQUIPMENT NOISE LEVELS

Construction Equipment	L_{max} at 50 feet	L_{max} at 500 feet	L_{max} at 1,000 feet	L_{max} at 1,500 feet
Cement and Mortar Mixers Composite	80	60	54.0	50.5
Concrete/Industrial Saws Composite	90	70	63.9794	60.45757
Cranes Composite	88	68	61.9794	58.45757
Excavators Composite	81	61	54.9794	51.45757
Forklifts Composite	85	65	58.9794	55.45757
Generator Sets Composite	81	61	54.9794	51.45757
Graders Composite	85	65	58.9794	55.45757
Other Construction Equipment Composite	85	65	58.9794	55.45757
Other General Industrial Equipment Composite	85	65	58.9794	55.45757
Pavers Composite	77	57	50.9794	47.45757
Paving Equipment Composite	77	57	50.9794	47.45757
Rollers Composite	80	60	53.9794	50.45757
Rubber Tired Dozers Composite	82	62	55.9794	52.45757
Scrapers Composite	85	65	58.9794	55.45757
Tractors/Loaders/Backhoes Composite	85	65	58.9794	55.45757
Welders Composite	73	53	46.9794	43.45757

Source: USDOT, 2006.

4.2.1.3 Mitigation Measures

No mitigation measures would be required.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Actions and the associated construction activities would not occur, and existing conditions discussed in **Section 3.3** would continue. Implementation of the No Action Alternative would not result in any new or additional impacts on the noise environment.

4.3 SAFETY AND OCCUPATIONAL HEALTH

An increased risk for bodily injury, illness, death, or property damage from the Proposed Actions would be considered an adverse impact on safety. Impacts associated with health and safety would be considered significant if the Proposed Actions were to:

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

4.3.1 PROPOSED ACTIONS

4.3.1.1 Construction Safety

No adverse impact on safety would be anticipated under the Proposed Actions. Short-term, minor impacts on contractor health and safety could occur from implementation of the Proposed Actions. The short-term risk associated with work performed by demolition and construction contractors would slightly increase at Tyndall AFB during the normal workday, as construction and demolition activity levels would increase. During construction and demolition, all actions would be performed in accordance with AFOSH directives and OSHA regulations. Occupational health and safety hazards associated with construction of the proposed new facilities and demolition of the existing structures under the Proposed Actions would include loud noise, heavy machinery, debris, electricity, and hazardous materials used or encountered during work. To minimize occupational health and safety risks, workers would wear and use appropriate PPE and follow applicable OSHA standards and procedures. Work areas would be clearly marked with appropriate signage and secured against unauthorized entry. The Proposed Actions would not pose new or unacceptable safety risks to installation personnel or activities at the installation but would enable Tyndall AFB to meet current and future mission objectives at the installation and conduct or meet mission requirements in a safe operating environment. No long-term impacts on safety would be expected.

ACM, LBP, and PCB-containing materials could be encountered during demolition activities for Project M-03. These materials require appropriate characterization, removal, handling, and disposal during demolition activities by qualified personnel; however, adherence to all Federal, state, local regulations, and Tyndall AFB management plans (e.g. Asbestos, Hazardous Waste, and Solid Waste Management Plans) would result in negligible impacts on safety during implementation of the Proposed Actions. Long-term, beneficial impacts on safety would be expected from the removal of ACM, LBP, and PCB-contaminated materials, which would reduce exposure to personnel. All proposed construction and

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

demolition activities would be conducted in accordance with Federal, state, and local regulations to minimize safety hazards associated with hazardous materials, wastes, and substances.

Changes to daily base activities and vehicular operations, including the addition of construction personnel on base, additional vehicles entering and exiting the base for construction operations, and the addition of heavy machinery/construction equipment to the base would result in a short-term increase in the potential for more accidents to occur. Furthermore, construction and demolition activities may require pedestrian and traffic detours. Standard construction traffic control measures and effective communication to installation personnel regarding changes to traffic would be used to protect workers and Tyndall AFB employees and visitors. Construction workers could encounter soil or groundwater contamination as a result of an ERP site or previously unknown soil or groundwater contamination. Workers and demolition and construction activities would be required to adhere to access restrictions and institutional controls to minimize exposure and risk. A health and safety plan would be developed and implemented by the selected contractors to further minimize potential impacts to health and safety of contractor employees.

Demolition and construction activities within the MSA (Project F-10) could expose workers to risk from stored munitions and ordnances. The risk of impacts to worker health and safety would be minimized by coordinating siting and construction plans with the installation safety office and ensuring explosives site plans have been approved before beginning construction as required in AFMAN 91-201, *Explosives Safety Standards*. (Air Force, 2017c).

4.3.1.2 Explosives and Munitions Safety

Short-term, minor impacts could occur during construction and demolition activities that would take place within existing ESQD arcs. Building demolition in the MSA associated with Project M-03, and building repair, renovation, and construction activities associated with Project F-10 would occur within an ESQD arc. Contractors working on these projects could be exposed to an increased risk of potential explosions. To avoid potential impacts on construction workers and the installation mission, these projects should be coordinated with the installation Safety Office to ensure that no handling or transportation of explosive materials would occur within ESQD arcs while workers are within these areas. This precaution would minimize explosive safety risks to workers. Prior to any trenching or other ground-disturbing work, the project areas should be surveyed for potential UXO. All of the project areas that are within established ESQD arcs would be mission-necessary and consistent with current land uses.

Project F-10 (Flightline – MSA Facilities, 7000 Area) would include construction of new munitions storage facilities. This would require reconfiguring roadways in the area and establishing new ESQD arcs. The reconfigured MSA would be required to meet explosives setback standards for munitions facilities and other facilities and land uses involving the presence of explosives at military installations. AFMAN 91-201 and DoD 605509-M, DoD Ammunition and Explosives Safety Standards: General Explosives Safety Information and Requirements (U.S. DoD, 2012a) jointly establish requirements for such facilities. As stated above, this proposed project would be mission-necessary and consistent with current land uses.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.3.1.3 Mission Safety

Several proposed projects would improve mission safety at Tyndall AFB. Project M-03 (Building Demolitions) would remove damaged and unstable structures that could pose a risk to human health and safety and would remove potential sources of contamination and risk from hazardous materials (e.g. ACM, LBP, and PCB-containing materials) within the structures. Project F-10 (Flightline – MSA Facilities, 7000 Area) includes repairs and renovations to certain structures that would improve their stability and safety. Project 9700-2 (Fire Station #4) would construct a satellite firefighting vehicle station to meet response times to the Silver Flag Training Area and AFCEC RDT&E Facilities. Projects 9700-1 (AFCEC RDT&E Facilities and Gate), F-03 (Tyndall AFB Gate Complexes [Flightline]), and SA-11 (Tyndall AFB Gate Complexes [Support]) would improve mission safety through enhancing installation access control by constructing perimeter fencing and vehicle inspection ports. Project SA-03 (Emergency Management, EOC, ALT CP) would construct an EM facility, EOC, and ALT CP facility to support EM actions for base operations. Together, these Proposed Actions would have a beneficial impact on mission safety. Because there would be measures in place to protect worker safety during construction and none of the Proposed Actions would hinder the ability to respond to an emergency or introduce a new health or safety risk to Tyndall AFB, no significant impacts to safety or occupational health would occur.

4.3.1.4 Mitigation Measures

No mitigation measures would be required.

4.3.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, construction and demolition activities would not occur and, thus, there would be no changes to safety and occupational conditions at Tyndall AFB. Continued mission operations within or adjacent to damaged facilities could induce a long-term adverse effect on airmen and employees at Tyndall AFB.

4.4 LAND USE

An action could have a significant effect on land use if it were to preclude the viability of a land use or the continued use or occupation of the area, be incompatible with adjacent land use to the extent that public health and safety is threatened, conflict with planning criteria established to ensure the safety and protection of human life and property, or result in noncompliance with laws, regulations, or orders applicable to land use.

Other relevant factors considered when evaluating potential impacts on land use include the existing and future land use designations both on and adjacent to the project site, the proximity of adjacent land use parcels to the project site, the duration of the proposed activity, and its permanence.

Tyndall AFB has identified and programmed individual projects spanning all four planning districts (**Section 3.5.2**), specifically the following six project areas; 2000 Area, 8500 Area, 9700 Area, Flightline Area, Silver Flag Area, Support Area, and the projects that span Multi-Areas.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.4.1 PROPOSED ACTIONS

Construction and operation of the Proposed Actions would not result in any significant impact on land use. Each of the individual Proposed Actions is consistent with current and future land uses as determined by Tyndall AFB and documented in installation planning documents and supports the installation’s long-range facility development plan (Air Force, 2015a). The existing land use and future land use compatibility of each Proposed Action are provided in **Table 4.4-1**.

TABLE 4.4-1 PROJECT LAND USE AND LAND USE COMPATIBILITY SUMMARY

Project Category	Planning District(s)	Project	Existing Land Use	Future Land Use	Compatibility
2000 Area Projects	Tyndall West Planning District	2000-1a, 2000-1b	Outdoor recreation	Outdoor recreation	Compatible
		2000-1c	Open Space	Outdoor Recreation, Community Service	Compatible - outdoor recreation permitted and community services permitted with restrictions.
8500 Area Projects	Support Area Planning District	8500-1	Industrial, Open Space	Industrial, Open Space	Compatible – industrial permitted with restrictions and although proposed activities not permitted within open space, meets the long-range planning goals of operational synergies & asset consolidation.
9700 Area Projects	Tyndall East Planning District	9700-1, 9700-2	Open Space	Industrial, Open Space	Compatible - industrial permitted and although proposed activities are not permitted within open space, meets the long-range planning goals of operational synergies, asset consolidation & perimeter and airspace security (Section 2.3.3)
Flightline Area Projects	Flightline Planning District	F-01 – F-09	Aircraft Operations and Maintenance	Aircraft Operations and Maintenance	Compatible
		F-10	Industrial	Industrial	Compatible
Silver Flag Area Projects	Tyndall East Planning District	SF-01	Training	Industrial	Compatible
Support Area Projects	Support Area Planning District	SA-03, SA-05, SA-06, SA-07, SA-08, SA-09, SA-10	Industrial, Administrative, Community services, Unaccompanied-housing, Medical, Open space, Community Commercial, Training, and		Compatible

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Planning District(s)	Project	Existing Land Use	Future Land Use	Compatibility
		SA-01, SA-02, SA- 11, SA-04	Outdoor Recreation		Compatible- permitted with restrictions
Multi-Area Projects	Flightline Planning District	M-01	Aircraft Operations and Maintenance	Aircraft Operations and Maintenance	Compatible
Multi-Area Projects	All Planning Districts	M-02	Various	Various	Compatible
		M-03	Various	Various	Compatible

Following Hurricane Michael, the Air Force established multiple task forces to assist the 325 FW in recovering the installation. One of the task forces was created to focus on installation facilities and infrastructure and ultimately the establishment of a PMO to continue to support Tyndall AFB redevelopment and reconstruction. The mission of the PMO is “To repair, reshape, and rebuild Tyndall AFB to support both near-term resumption of mission operations and long-term redevelopment of Tyndall as the model Air Force ‘Installation of the Future’.” As a result, Air Force planners developed a Master Plan in accordance with Air Force guidance to guide the future planning and development of Tyndall AFB.

The future planning efforts implement future development planning strategies outlined in UFC 2-100-01. They support the DoD-wide installation planning philosophy to develop a sustainable platform to support the effective execution of assigned missions as efficiently as possible, thus adopting the future planning recommendations as established in the IDP (Air Force, 2015a). Therefore, construction and implementation of the Proposed Actions are consistent and compatible with future land uses as determined by Tyndall AFB.

Construction and implementation of the Proposed Actions would be in all four planning districts on Tyndall AFB. Future development on Tyndall AFB should be consistent with the Tyndall AFB Master Plan/Area Development Plan, IDP and the planning goals established in the future land use plan. The future land use plan for Tyndall AFB considers land use compatibility, facility consolidation, mission sustainability, quality of life, safety and security, and past Tyndall AFB planning studies. A major emphasis of the installation’s long-range facility development plan is to consolidate land uses and collocate similar functions. Therefore, long-term beneficial impacts from implementation of the Proposed Actions would occur.

4.4.1.1 Mitigation Measures

No mitigation measures would be required.

4.4.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Actions would not occur and the temporary conditions and uses of land and facilities would continue. Implementation of the No Action Alternative would cause significant adverse effects on land use on Tyndall AFB. The installation mission support services, tenants and personnel would continue to operate in temporary locations, facilities and under encumbered conditions that do not adequately meet long-term mission requirements or Air Force standards. Pre-

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

storm existing land use conditions would not be realized; therefore, continuation of conducting installation operations in temporary conditions will result in short-term adverse impacts to land use. Implementation of the No Action Alternative does not follow the future planning recommendations as established by Tyndall AFB; therefore, long-term adverse impacts on land use would occur. In addition, retaining damaged buildings, facilities and infrastructure on Tyndall AFB would result in long-term adverse impacts on land use as re-development would not occur.

4.5 SOILS

4.5.1 PROPOSED ACTIONS

Site preparation and construction activities would directly disturb approximately 1164 acres of native and non-native soils, over half of which (approximately 629 acres) would result from the Flightline drainage improvement and utility upgrade projects. Erosion from the construction sites could result in additional indirect effects; consequently, any soil disturbance that would expose the soils to wind, rain, and stormwater runoff must be stabilized by some means. Tyndall AFB would be required to obtain a Stormwater Construction Permit from the FDEP prior to construction. The construction contractor would be required to develop a SWPPP specific to each site that would detail erosion prevention and control measures to be implemented during site preparation and construction activities. No prime or unique farmland soils would be disturbed or removed from the project area.

Table 4.5-1 presents the soil types and amounts that would be disturbed under the Proposed Actions (refer back to **Section 3.6** for a breakdown of these soils types per individual Proposed Action). As can be seen from this table, the Arents, Pottsburg, Leon, and Mandarin soil types compose the majority of land to be disturbed. Arents soils are a man-made mixture of various soil series, resulting from earth moving operations such as dredging and filling and are not prone to either flooding or ponding. The other three most commonly disturbed soil types typically occur on flat areas above marine terraces and are considered to be poorly drained but not prone to flooding. There would be minor impacts on soils upon implementation of the Proposed Actions.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 4.5-1 SOIL TYPES AND AMOUNTS

Soil Type	Acres Impacted	% of Total
Allanton sand	0.4	<1%
Arents, 0 to 5 percent slopes	248.8	21%
Bayvi loamy sand	2.9	<1%
Beaches	14.1	1%
Chipley sand, 0 to 5 percent slopes	3.8	<1%
Fripp-Corolla complex, 2 to 30 percent slopes	9.4	<1%
Hurricane sand, 0 to 2 percent slopes	35.1	3%
Kureb sand, 0 to 5 percent slopes	0.9	<1%
Leon sand, 0 to 2 percent slopes	210.8	18%
Mandarin sand, 0 to 2 percent slopes	235.0	20%
Osier fine sand	47.7	4%
Pamlico-Dorovan complex	9.0	<1%
Pickney fine sand	1.1	<1%
Pits	0.0	0%
Pottsburg-Pottsburg, wet, sand, 0 to 2 percent slopes	175.0	15%
Resota fine sand, 0 to 5 percent slopes	44.2	4%
Rutlege sand, 0 to 2 percent slopes	60.7	5%
Urban land	60.0	5%
Water	4.3	<1%

Sources: USDA NRCS, 2019

4.5.1.1 Mitigation Measures

No mitigation measures would be required.

4.5.2 NO ACTION ALTERNATIVE

No construction or ground disturbing activities would occur under this alternative. Therefore, the No Action Alternative would have no direct or indirect impacts, either beneficial or adverse, on soils.

4.6 WATER RESOURCES

4.6.1 PROPOSED ACTIONS

4.6.1.1 Surface Water

The Proposed Actions may potentially have temporary, negligible impacts on surface waters as a result of increases in erosion and sedimentation during periods of construction or demolition. Disturbed soils and hazardous substances (i.e. POLs) could directly impact water quality during a major rain event. However, through the use of BMPs, as outlined in the SWPPP, these effects would be minimal.

4.6.1.2 Groundwater

Proposed construction and demolition activities would not involve withdrawals from, or discharges to surface water bodies or groundwater. Groundwater within the surficial aquifer may be encountered during certain types of construction activities such as excavation within the footprint of new facilities. Any dewatering necessary during such construction activities would be conducted using standard methods and would have no effect on groundwater quality or flow. Hazardous materials used and hazardous waste

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

generated during construction would be managed in accordance with all applicable environmental compliance regulations and Tyndall AFB environmental management plans. Therefore, negligible to minor impacts on groundwater would be expected.

4.6.1.3 Wetlands

Appropriate BMPs and engineering controls should be implemented during construction to limit the extent of damage to wetland and other surface water habitat in all project areas. It is estimated that approximately 134.9 acres of wetlands and 120,300 LF (i.e., drainage features) and 15.8 acres (stormwater pond/open water/drainage features) of other surface waters are located within the proposed project areas. The majority of these wetlands and other surface waters are highly disturbed and altered due to hurricane damage and timber harvest/salvage operations (Tyndall AFB, 2020). As mentioned in **Section 3.7.3**, a formal Jurisdictional Determination of the wetlands and other surface waters will be determined during the state and Federal permitting process. During design and permitting, efforts will be made to minimize impacts to wetlands and other surface waters to the greatest extent practicable.

All wetlands located within the proposed project areas were further assessed using the UMAM per Chapter 62-345, F.A.C. The assessment was performed for all wetland acreage included in each Proposed Action project footprint, because the notional construction within those footprints shown in **Section 1.4** of this EA may be subject to change during final design. The UMAM methodology provides a standardized procedure used by all regulatory agencies in Florida for assessing the functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset that loss. The wetland function indicators measured by UMAM include:

- Location and Landscape Support,
- Water Environment, and
- Community Structure.

Table 4.6-1 shows the preliminary results of the UMAM assessment score (delta) for each wetland, the acreage, and the functional loss associated with the acreage. Other surface waters, though potentially jurisdictional, were not included in this assessment. As described above, this assessment assumes all wetlands located within the Proposed Action areas that have been surveyed would be impacted, as the notional construction within each project footprint may change during final design. However, as previously mentioned, minimization measures to reduce these impacts during the design and permitting phase will be implemented. Therefore, approximately 134.9 acres of wetlands were assessed using UMAM. Therefore, the approximate functional loss of wetland values as a result of construction of the Proposed Actions is 75.95 units. UMAM scores are approximate and will be further refined during the permitting process and formal jurisdiction approval.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

**TABLE 4.6-1 UNIFORM MITIGATION ASSESSMENT METHODOLOGY (UMAM) ANALYSIS OF
WETLAND IMPACTS RESULTING FROM THE PROPOSED ACTIONS**

Project Category	Wetland ID	FLUCFCS Code	USFWS Description	Delta	Acres	Functional Loss (Units)
2000 Area Projects	5	643	PEM1J	0.37	1.8	0.66
	6	630	PFO3J	0.57	0.4	0.23
	7	643	PEM1J	0.30	0.2	0.06
	8	643	PEM1J	0.37	1.4	0.51
<i>Subtotal – 2000 Area</i>					3.8	1.5
8500 Area Projects	4	631	PSS3C	0.50	2.3	1.15
9700 Area Projects	1	643	PEM1E	0.57	24.7	14.00
	2	641	PEM1F	0.57	0.3	0.17
	3	643	PEM1E	0.57	45.7	25.91
<i>Subtotal – 9700 Area</i>					70.7	40.08
Support Area Projects	9	641	PEM1C	0.37	0.2	0.07
	14	631	PSS3E	0.33	0.8	0.27
<i>Subtotal – Support Area</i>					1.0	0.34
Multi-Area Projects	10	641	PEM1C	0.33	0.3	0.10
	11	640	PEM1F	0.23	0.2	0.05
	12	641	PEM1C	0.43	0.1	0.04
	13	631	PSS3D	0.23	0.1	0.02
	15	646	PSS3D	0.60	3.5	2.10
	16	643	PEM1K	0.40	1.1	0.44
	17	640	PEM1C	0.33	0.9	0.30
	18	640	PEM1C	0.33	4.4	1.47
	19a	642	E2EM1N	0.67	0.6	0.40
	19b	642	E2EM1N	0.90	3.8	3.42
	19c	642	E2EM1N	0.73	0.6	0.44
	19d	626	PFO4K	0.77	5.9	4.52
	19e	631	PFO3J	0.57	0.5	0.28
	19f	642	E2EM1N	0.57	26.0	14.73
	19g	630	PFO7E	0.57	6.2	3.51
	20	640	PEM1C	0.33	0.7	0.23
21	631	PSS3C	0.40	2.0	0.80	
22	640	PEM1C	0.33	0.2	0.07	
<i>Subtotal – Multi-Area</i>					57.1	32.92
Grand Total					134.9	75.95

Sources: Tyndall AFB, 2020.

Notes:

1. UMAM analysis is preliminary and will be refined during permitting process.
2. Values reflect rounding.

4.6.1.4 Floodplains

As shown in **Table 3.7-2**, a total of approximately 126.9 acres of the Proposed Action areas are located within the 100-year floodplain. During the design phase, the construction footprint for each of the Proposed Actions will implement design measures to avoid/minimize impacts to floodplains to the

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

greatest extent practicable. Unavoidable impacts to floodplains resulting from the implementation of the Proposed Actions will be mitigated.

The Proposed Actions may increase the risk or impact of floods on human safety or adversely impact the beneficial values that floodplains serve. The Proposed Actions may increase the duration, frequency, velocity, or volume of flood events due to the reduction of floodplain capacity. All potential effects, if any, would remain on Tyndall AFB property. Mitigation actions to address these impacts are discussed in **Sections 4.6.1.3 and 5.0.**

4.6.1.5 Coastal Zone Management

Based on the geography of Florida and the legal basis for the state program, the entire state of Florida is included within the coastal zone. Geographically, Florida has low land elevation, a generally high water table, and an extensive coastline with many rivers emptying into coastal waters. Few places in Florida are more than 70 miles from either the Atlantic Ocean or the Gulf of Mexico. The result is an interrelationship between the land and coastal waters, which makes it difficult to establish a boundary that would exclude inland areas. Because of this relationship, the state boundaries include the entire area encompassed by the state’s 67 counties and its territorial seas. All of Tyndall AFB is within Florida’s coastal zone, as defined by the FCMP. While Federal lands such as Tyndall are statutorily excluded from Florida’s coastal zone, Federal approval of the FCMP elicits Section 307 of the CZMA and mandates that activities on Federal lands that have the potential to affect coastal resources or uses on non-Federal lands comply to the maximum extent practicable with the enforceable policies of the FCMP. Florida’s CZMP includes the 24 enforceable policies (statutory authorities) incorporated into the federally approved FCMP. **Table 4.6-2** provides a summary of the 24 enforceable policies and the Proposed Action’s consistency with each policy.

The Air Force (i.e., Tyndall’s Natural Resources Office) submitted an analysis of the CZMA Consistency Determination and requested a Concurrence of these determinations from the Florida State Clearinghouse for the construction actions, as part of the public Draft EA. The determination from the State was received on 4 March 2020, and states that based on minimal project impacts, the State has no objections to the subject project and, therefore, it is consistent with the FCMP. Tyndall AFB management policies provide for the sustainable water management and the conservation of surface water and groundwater for full beneficial use.

TABLE 4.6-2 FLORIDA COASTAL MANAGEMENT PROGRAM CONSISTENCY REVIEW

Florida Statute	Legal Scope	Consistency Evaluation
Chapter 161 <i>Beach and Shore Preservation</i>	Authorizes the Bureau of Beaches and Coastal Systems within FDEP jurisdiction to regulate construction on or seaward of the state’s beaches.	The Proposed Actions would not adversely affect beach and shore management, specifically as it pertains to the Coastal Construction Permit Program, the Coastal Construction Control Line (CCCL) Program, and the Coastal Zone Protection Program. The Proposed Actions would occur within Tyndall AFB and would not occur seaward of the CCCL.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development</i>	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a	The Proposed Actions would occur within Tyndall AFB and therefore would not affect municipal or county government comprehensive plans.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Florida Statute	Legal Scope	Consistency Evaluation
<i>Regulation</i>	manner consistent with the public interest.	
Chapter 186 <i>State and Regional Planning</i>	Details state level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.	As part of the NEPA process, the Proposed Actions has been coordinated with Federal, state and local governments and agencies, including the FDEP State Clearinghouse, for compatibility with state and regional planning.
Chapter 252 <i>Emergency Management</i>	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and man-made disasters.	The Proposed Actions would not have an effect on the ability of the state to respond to or recover from natural or manmade disasters.
Chapter 253 <i>State Lands</i>	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.	The Proposed Actions would occur entirely within Tyndall AFB. No state lands would be disturbed during the construction, renovations, infrastructure construction, or demolitions and therefore, would not be affected.
Chapter 258 <i>State Parks and Preserves</i>	Addresses administration and management of state parks and preserves.	The Proposed Actions would not directly impact state parks, recreational areas or preserves. Secondary or indirect impacts to environmental or social resources related to these facilities are not anticipated. Opportunity for recreation on state lands would not be affected.
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands.	The Proposed Actions would occur within Tyndall AFB and would not have an effect on the acquisition of environmentally endangered and outdoor recreation lands.
Chapter 260 <i>Recreational Trails System</i>	Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system.	The Proposed Actions would occur within Tyndall AFB and would not have an impact on the acquisition of land to create a recreational trails system.
Chapter 267 <i>Historical Resources</i>	Addresses management and preservation of the state's archaeological and historical resources.	The Proposed Actions is not expected to adversely affect historical or cultural resources of the State of Florida. Section 106 of the NHPA consultation with the Florida SHPO is ongoing. The Cultural Resources Survey Report completed for the Proposed Action Proposed Actions has been submitted to the SHPO and any mitigation measures identified during the consultation will be included in the Final EA.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.	The Proposed Actions would occur on an active military installation with limited access to the public and limited or no implications for or effect on general business, trade, and tourism components of the state economy.
Chapter 334 <i>Transportation Administration</i>	Addresses the state's policy concerning transportation administration.	The Proposed Actions would not have an impact on the state's transportation administration policies.
Chapter 339 <i>Transportation Finance and Planning</i>	Addresses the finance and planning needs of the state's transportation system.	The Proposed Actions would not have an effect on the finance and planning needs of the state's transportation system.
Chapter 373 <i>Water Resources</i>	Addresses the state's policy concerning water resources.	The Proposed Actions could have negligible to minor impacts on surface water and groundwater.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Florida Statute	Legal Scope	Consistency Evaluation
		<p>Temporary, indirect, negligible adverse impacts from soil disturbance could create non-point source water pollution; however, BMPs would be utilized to reduce the chance of impacts on surface water resources.</p> <p>The Proposed Actions could impact up to 126.9 acres of floodplains and could decrease the beneficial values that floodplains provide; however, all effects occur on Tyndall AFB and would result in negligible to minor impacts on floodplains. Design measures would be implemented to avoid/minimize impacts to floodplains. Mitigation would be provided for unavoidable floodplain impacts.</p> <p>The Proposed Actions could impact up to 134.9 acres of wetlands and up to 120,300 LF and 15.8 acres of other surface waters. Design measures would be implemented to avoid/minimize impacts to wetlands and other surface waters. The Air Force, USACE and FDEP/NWFWMD will identify the appropriate mitigation efforts to offset these impacts. Overall, there would be no significant impacts on water resources as a result of the Proposed Action.</p>
<p>Chapter 375 <i>Outdoor Recreation and Conservation Lands</i></p>	<p>Develops comprehensive multipurpose outdoor recreation plans to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs.</p>	<p>The Proposed Actions would not impact the state's development or evaluation of multipurpose outdoor recreation plans.</p>
<p>Chapter 376 <i>Pollutant Discharge Prevention and Removal</i></p>	<p>Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.</p>	<p>During construction, the contractor would be required to prepare project-specific SPCC documenting measures to prevent accidental release to the environment and, should they occur, the corrective action to minimize environmental impacts. Project-specific BMPs would be implemented for the operation of the Proposed Actions in accordance with existing or modified stormwater discharge permit conditions.</p> <p>The Proposed Actions would not alter the types of hazardous and other regulated materials used at Tyndall AFB (e.g., cleaning solvents, lubricants). No involvement and impact associated with hazardous materials or wastes is anticipated.</p> <p>The Proposed Actions would not involve the transfer of pollutants between vessels; between onshore facilities and vessels; between offshore facilities and vessels; or between terminal facilities within jurisdiction of the state and state waters.</p>
<p>Chapter 377</p>	<p>Addresses regulation, planning,</p>	<p>Implementation of the Proposed Action would not</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Florida Statute	Legal Scope	Consistency Evaluation
<i>Energy Resources</i>	and development of energy resources of the state.	cause unsupportable demands on available natural resources or energy supplies, and construction and operation of the Proposed Action would not require consumable natural
Chapter 379 <i>Fish and Wildlife Conservation</i>	Addresses management and protection of fish and wildlife in the state.	<p>The Proposed Actions would have permanent, adverse effects on vegetation potentially utilized by wildlife. Undeveloped uplands and wetlands/other surface waters potentially providing habitat to wildlife species may be impacted by the Proposed Actions; however, based on the October and November 2019 field reviews, a large portion of these habitats have been previously disturbed by timber harvest/salvage operations.</p> <p>Disturbances to wildlife within these habitats could include mortality due to construction activities; degradation and loss of habitat causing loss of burrow or nests, cover, or forage habitat; and noise disturbance from construction activities disrupting wildlife activity and behavior. However, the small number of individuals expected to be lost would not appreciably reduce the overall population of wildlife species found known to occur within the area surrounding Tyndall AFB.</p> <p>Some individual telephus spurge specimens (federally threatened) are likely to be lost as a result of the Proposed Actions; however, the Air Force and USFWS have identified the proper conservation measures to offset these impacts through Section 7 consultation. Lighting systems used during the Proposed Actions would be designed to avoid or reduce illumination effects on sea turtles and coordination with Tyndall Natural Resources Section would be required prior to any ground disturbing activities. If any gopher tortoise burrows cannot be avoided by 25 feet, the tortoises would be relocated in accordance with Tyndall AFB's <i>Threatened and Endangered Species Component Plan</i> (Air Force, 2018b) and FWC's current guidelines. If gopher tortoises are in close proximity to the construction site, silt fencing or some other type of barrier would be erected to keep tortoises from moving into the construction area after surveys have been completed.</p>
Chapter 380 <i>Land and Water Management</i>	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.	The Proposed Actions would be developed consistent with local land and water management plans. The Proposed Action is subject to local permit, stormwater, and environmental requirements and review. The Proposed Actions will require coordination with and authorization from the USACE and the NFWFMD/FDEP.
Chapter 381 <i>Public Health, General Provisions</i>	Establishes public policy concerning the state's public health system.	The Proposed Actions does not involve the construction of an onsite sewage treatment and disposal system. Construction activities associated with the Proposed Actions are governed by

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Florida Statute	Legal Scope	Consistency Evaluation
		regulations established by the AFOSH Program and the OSHA. No appreciable change in the type, quantity, or disposal of solid wastes is expected. The Proposed Actions would not impact public policy or management in regard to sanitation, communicable diseases, or public health.
Chapter 388 <i>Mosquito Control</i>	Addresses mosquito control efforts in the state.	The Proposed Actions would not affect local mosquito control efforts or contribute to increased propagation of mosquitos.
Chapter 403 <i>Environmental Control</i>	Establishes public policy concerning environmental control in the state.	<p>The construction and operations of the Proposed Actions would include project-specific BMPs and pollution prevention measures. The Proposed Action is not expected to exceed applicable state water quality standards or have substantial and longer-term water quality impacts.</p> <p>Air pollutant emissions associated with construction of the Proposed Actions would not exceed Air Force significance thresholds or cause exceedances of air quality standards. Long-term air emissions increases resulting from the Proposed action are expected to be negligible.</p> <p>Construction wastes and operational wastes would be collected, transported, recycled, and disposed of in compliance with applicable state and local regulations. The Air Force would obtain and comply with all applicable permits as required by law.</p>
Chapter 553 <i>Building Construction Standards</i>	Provides a mechanism for the uniform adoption, updating, amendment, interpretation, and enforcement of a single, unified state building code, to be called the Florida Building Code. Obtain a permit from the appropriate enforcing agency.	The Proposed Actions would not affect the Building Construction Standards of the State of Florida. The Air Force would obtain and comply with all applicable permits as required by law.
Chapter 582 <i>Soil and Water Conservation</i>	Provides for the control and prevention of soil erosion.	A SWPPP would be developed and followed, and BMPs addressing erosion and sediment controls would be implemented to minimize impact to soils and water quality. The Proposed Actions would be consistent with the current characteristic features of the area and landscape and would not result in any changes to land use. The Proposed Actions would not affect soils or farmland within a Soil and Water Conservation District and would not convert prime farmland.
Chapter 597 <i>Aquaculture</i>	Establishes public policy concerning the cultivation of aquatic organisms.	The Proposed Actions has no activities related to the cultivation of marine species in the Study Area. The Proposed Actions activities would not affect aquaculture.

Source: Florida Statutes, as identified in table.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.6.1.6 Mitigation Measures

For construction activity related to the Proposed Actions, a NPDES stormwater permit implementing appropriate pollution prevention techniques will be obtained from the FDEP. Any wastewater collection/transmission systems will require authorization from the FDEP pursuant to Chapter 62-604, F.A.C. and public drinking water system modifications will be authorized by FDEP pursuant to Chapter 62-555.900, F.A.C. In addition, pursuant to Section 373 Part IV, F.S., any construction and operation of surface water management systems will require an ERP from the FDEP or NFWFMD to ensure that activities or situations are not harmful to the water resources or inconsistent with the public interest. A CWA Section 404 permit and a Section 401 water quality certification would be required prior to any dredge and/or fill actions within federally jurisdictional wetlands.

Mitigation will be required to offset impacts on state and/or federally jurisdictional wetlands. Wetland impacts resulting from construction of the Proposed Actions will be mitigated to satisfy all mitigation requirements of 33 U.S.C. 1344 and Part IV, Chapter 373 F.S. During the process of obtaining these permits, USACE, Air Force, and FDEP will identify the necessary mitigation required to offset impacts to jurisdictional wetlands and other surface waters. The preference would be to avoid wetland impacts, but since that is likely not possible, the Air Force will consider on-site and in-kind, off-site and in-kind, and obtaining credits from approved mitigation banks. Currently, there is one wetland mitigation bank (Horseshoe Creek Mitigation Bank) that services this area and is pending state and Federal permits to eventually have freshwater herbaceous, freshwater forested, and saltmarsh wetland credits available. Therefore, implementation of the Proposed Actions would not result in significant impacts on wetlands.

Drainage system improvements associated with the Proposed Actions would be designed to properly convey and store stormwater flows, and would not impede floodwater flows during major storm events. The Proposed Actions' design would comply with local floodplain management policies and regulations, which promote designs to minimize flood impacts. Adverse effects could be further minimized by elevating all facilities above the base flood elevation (BFE), applying construction period erosion and sedimentation controls, and using pervious surfaces for stormwater retention and treatment where possible.

Implementation of a SWPPP and the BMPs identified in the SWPPP will reduce or eliminate the potential for eroded soils and contaminants from entering surface water bodies and groundwater. Consultation with the Florida State Clearinghouse will facilitate identification of mitigation measures, if needed, under the CZMA.

Approximately 126.9 acres of floodplains would be impacted by the Proposed Actions. As part of the alternatives analysis conducted for the Proposed Actions, siting and construction were evaluated based on three project-specific selection standards. Selection standard SS-04 includes minimizing impacts on natural systems, including floodplains. Therefore, pursuant to EO 11998, the Air Force has concluded that there is no practicable alternative to siting and constructing the individual projects included in the Proposed Actions. Accordingly, the following mitigations are required to: 1) protect structures sited in the floodplain, and 2) minimize impacts to flood elevation, function and capacity within floodplain areas.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

First, design elements will be incorporated into the individual projects that would encroach on floodplains to minimize and mitigate potential floodplain impacts to the greatest extent practicable. In general, building footprints would be reduced as much as possible to minimize encroachments into the floodplain. Other design elements could include constructing buildings on land elevated above the BFE through placement of fill; establishing basement elevations and first floor elevations consistent with potential flood levels; and elevating utilities and equipment that might be hazardous to life if submerged.

Additionally, to minimize impacts to flood elevation, function and capacity within the 100- and 500-year floodplain due to cut and fill activities, compensatory storage will be provided by excavating material within or adjacent to the same floodplain to be used as fill, in a manner that does not disturb or impact wetlands, endangered vegetation, or potential cultural sites.

4.6.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, no construction or demolition activities would occur; therefore, there would be no direct impacts on surface waters, groundwater, wetlands, floodplains or the coastal zone. Timber salvage efforts would likely continue, and depending upon if skidder trails are constructed in the wetland areas, could impact wetlands through the removal of herbaceous and shrub level plants, the potential introduction of non-native species, and/or the alteration of natural waterflow patterns. However, no significant impacts are anticipated.

4.7 BIOLOGICAL RESOURCES

4.7.1 PROPOSED ACTIONS

The Proposed Actions would have permanent, adverse effects on vegetative cover potentially utilized by wildlife. **Tables 3.8-1a** through **3.8-1g** summarizes the land use/vegetative cover mapped within the proposed project areas. Undeveloped uplands and wetlands/other surface waters potentially providing habitat to wildlife species may be impacted by the Proposed Actions; however, based on the October-November 2019 and January 2020 field reviews (Tyndall AFB, 2020), a large portion of these habitats have been previously disturbed by timber harvest/salvage operations. During the design phase of each of the Proposed Actions, efforts will be made to reduce the construction footprints to the greatest extent possible to minimize impacts to wildlife habitat. There is a potential for wildlife mortality of individuals found in the proposed project areas during construction activities. These mortalities are most likely to involve small, slow-moving animal species that take cover in leaf litter or upper soil layers, such as various rodent, amphibian, and reptile species. The direct degradation and loss of habitat would also potentially impact burrows and nests, as well as cover, forage, and other important wildlife resources. The loss of these resources would result in the displacement of individuals that would then be forced to compete with other wildlife for the remaining resources. Disturbances due to noise generated by construction equipment may disrupt wildlife activity temporarily, particularly avian courtship and breeding behaviors. However, the small number of individuals expected to be lost would not appreciably reduce the overall population of wildlife species known to occur within the area surrounding Tyndall AFB. It would be expected that species utilizing this habitat would move to adjacent similar habitat. Therefore, the displacement of wildlife would minimally reduce the population size within the proposed project areas, and would have a negligible effect on the overall population viability.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Based upon information identified in the Biological Assessment for the Proposed Actions (USFWS, 2019a), the Air Force has determined that the Proposed Actions may affect and is likely to adversely affect the telephus spurge. The Air Force has determined that other construction, demolition, or renovation activities would have no effect on any other federally and/or state listed species. Surveys were conducted for all species and the telephus spurge was the only species recorded at any of the project sites. Design of new facilities, particularly those nearer to the beaches, will include measures to avoid lighting disturbance on sea turtles. No physical construction would occur on beach areas and therefore no adverse effects on sea turtles are anticipated.

Section 7 consultation with USFWS for the telephus spurge has been completed as of 25 March 2020. On 25 March 2020, USFWS submitted a BO that includes an Incidental Take Statement and Conservation Recommendations (**Appendix B**). The USFWS concluded that the Proposed Actions are *not* likely to *jeopardize the continued existence* of the telephus spurge and fulfills the Air Force's responsibilities under Section 7(a)(2) of the ESA. The conservation measures recommended by the USFWS are summarized below:

- Avoid impacting telephus spurge plants in the Action area.
- If impacts to the plants with corresponding habitat cannot be avoided, then:
 - *In-* and *ex- situ* plant relocation and post-transplanting monitoring. A knowledgeable botanist/consultant should be onsite to advise responsible groups on how to transplant plants to the proposed relocation site. A relocation plan as well as a post-transplanting monitoring plan should be developed in collaboration with a USFWS botanist. The plants should be monitored for at least five years and an annual report, including a copy of all data collected, be provided to the USFWS. For this recommendation, all telephus spurge sexual morphs should be identified, collected and transplanted.
 - Collect seeds from female and monoecious plants and test viability (germination potential) using tetrazolium staining solution or other approaches.
 - Conduct root tip squashes from actively growing root tips for the study of chromosome number and ploidy-level.
 - Collect and plant seeds, if available, into a suitable habitat within the Tyndall AFB, and monitor germination and seedling survival over time, preferably more than five years. An annual report should be provided to the USFWS.
 - Collect voucher specimens (e.g., herbarium specimens, samples for DNA analyses, preserve material and seeds) and distribute to herbaria, botanical gardens (i.e., Bok Tower Garden, Atlanta Botanical Garden, and interested scientists).
- Integrate telephus spurge plants as part of the facilities' green space. Landscaping and restoration initiatives such as planting native species obtained within the Action area are encouraged. Since impacts to the plants with corresponding habitat cannot be avoided, relocation of some plants to facilities' green space (once the Action is completed) is also recommended.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Develop a comprehensive management plan or a programmatic BO for federally listed plant species occurring at Tyndall AFB. The documents should address cumulative impacts to the species, and issues such as protection, monitoring and management.

On February 5, 2020, the FWC submitted a letter to the Florida State Clearinghouse in response to reviewing the Draft EA (**Appendix B**). The FWC's responses are summarized below:

- Potential staging areas could result in impacts to protected wildlife species. FWC staff recommend including a commitment in the EA to survey and evaluate potential staging area sites for impacts to protected wildlife species.
- In order to better identify the potential for impacts, surveys for listed species should be completed prior to any phases of clearing or development, and particularly for any staging areas that were not identified in the Draft EA. Species-specific wildlife surveys are time sensitive, and FWC staff recommends that all wildlife surveys follow established survey protocols approved by the USFWS and the FWC and that the surveys are conducted at the appropriate time of year. Surveys should also be conducted by qualified biologists with recent documented experience for each potential species.
- State-listed seabirds and shorebirds overwinter and nest in the beach dune habitat within and adjacent to the proposed project site. Between 2017 and 2018, FWC staff documented approximately 337 instances of imperiled beach nesting shorebird nesting within one mile of the proposed work activities. Existing site conditions may also support beach-nesting bird breeding habitat and clearing associated with construction may create conditions conducive for nesting. Cleared sites such as areas that have undergone surface scraping and that leave open sandy soils may attract ground-nesting species such as least terns, black skimmers, or other imperiled beach-nesting birds (IBNB). IBNB nests have been documented on a variety of disturbed sites, including construction sites. Nesting has occurred on nearby projects in similar locations and with similar soil composition. In addition to the beach dune areas and cleared sites with exposed bare soils, imperiled beach nesting birds can also utilize buildings with gravel rooftops for nesting and have been documented nesting on these types of buildings on Tyndall AFB.

Egg-laying usually begins in early April and colonies may range in size from a few breeding pairs to many hundreds. FWC staff recommends the following measures to reduce nesting potential during construction:

- Conduct construction and/or demolition activities outside of the breeding season (generally April, but potentially as early as mid-February, through August), if feasible;
- Clear the site only when ready to build;
- Avoid leaving cleared areas or potentially suitable nesting sites (such as gravel rooftops) with little to no activity for an extended amount of time; and
- Monitor daily proposed works sites during the nesting season any cleared sites to ensure no active nests of ground nesting birds are present prior to the commencement of construction or demolition activities.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

If nesting is observed within or adjacent to a demolition or construction work site prior to or after the start of work, we recommend coordinating with FWC staff at the end of this letter to discuss nest buffers and other avoidance and minimization measures.

- The beaches at Tyndall AFB support nesting by loggerhead and green sea turtles and occasionally leatherback and Kemp's ridley turtles. The base has an active Sea Turtle Program that surveys and marks all sea turtle nests on the base's approximately 18 miles of beaches under an FWC marine turtle permit. During January 2019, FWC staff participated in a meeting with staff from the Tyndall AFB and the USFWS to discuss appropriate lighting to minimize impacts to coastal wildlife including sea turtles and beach mice.

FWC supports the base's efforts to reduce and minimize lighting impacts to coastal wildlife during hurricane recovery activities. For implementation, FWC staff recommends an exterior lighting plan be developed. The plan should specify long wavelength (560 nanometers or shorter) lamps with the lowest lumen output necessary to meet the required design foot candles. Lamps should be installed in full cut-off, fully shielded fixtures mounted at the lowest height possible. To minimize visibility of lights from the adjacent beach, bollards – 42 inches or less in height – should be utilized in parking areas. Poles along roadways should be limited to 15 to 18 feet in height. In addition, restoration of coastal vegetation should include taller, shrubby plants that can serve as a barrier to landward lights and block sky glow.

- FWC has received 186 reports of human-bear conflicts within a one-mile radius of the project site since 2006. Florida black bears are frequently observed on Tyndall AFB which is within the East Panhandle Bear Management Unit identified in the 2019 Bear Management Plan. The INRMP for Tyndall AFB includes management objectives to maintain the current population, reduce negative human-bear interactions, remove bear attractants from populated areas on base, and educate the public. FWC staff recommend that Tyndall AFB continue to follow and implement these management objectives, since proactive planning may help prevent or reduce future conflicts with bears.
- Although a field review was conducted with no gopher tortoises observed, gopher tortoises have been documented on Tyndall AFB and could occur in any of the proposed project locations. Due to the documented presence of gopher tortoise burrows on the adjacent property, and the phased development of the site over many years, FWC staff recommends that the applicant refer to the FWC's Gopher Tortoise Permitting Guidelines (Revised January 2017) as necessary for technical assistance and survey methodology.
- Although Florida pine snakes have been not been documented on Tyndall AFB, they can occur in xeric (well-drained), upland habitat, which is present throughout the base property. Florida pine snakes are active from March through October but show the greatest activity in May, June, July, and October when they move more frequently and travel farther distances. If a Florida pine snake is observed during construction, FWC staff recommends that work activities cease and the snake be allowed to leave with no support or hinderance. It would also contribute to FWC's research efforts if sightings are reported to the staff member at the close of this letter, preferably with a photograph and GPS coordinates.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.7.1.1 Mitigation Measures

No mitigation measures would be required for general wildlife populations. During the design and permitting phase for the Proposed Actions, and prior to clearing and development, all potential staging areas will be surveyed and evaluated for potential impacts to protected wildlife and listed species. All wildlife surveys will follow established survey protocols approved by the USFWS and the FWC and will be conducted by qualified biologists with recent documented experience for each potential species.

To reduce the potential of shorebirds nesting during construction, construction and/or demolition activities will be conducted outside of the breeding season; sites will only be cleared when ready to build; cleared areas that could become potential nesting sites will not be left for an extended amount of time; and proposed work sites will be monitored during the nesting season prior to clearing, demolition, or construction activities to ensure no active nests are present. If nesting is observed within or adjacent to a demolition or construction work site prior to or after the start of work, coordination with the FWC will be implemented to discuss nest buffers and other avoidance and minimization measures.

Any new lighting systems will be designed to avoid or reduce illumination effects on sea turtles.

Avoidance of the telephus spurge populations at the gate site would be achieved, if practicable, or salvage/relocation of the affected populations would occur, pursuant to the recommendations set forth in the USFWS' 25 March 2020 BO.

Within 30 days of ground disturbance, Tyndall AFB Natural Resources would complete a gopher tortoise survey at and in the vicinity of the construction sites. If any found burrows cannot be avoided by 25 feet, the tortoises and any commensal species would be relocated in accordance with Tyndall AFB's *Threatened and Endangered Species Component Plan* (Air Force, 2018b) and FWC's current guidelines. If gopher tortoises are in close proximity to the construction site, silt fencing or some other type of barrier would be erected to keep tortoises from moving into the construction area after surveys have been completed.

If a Florida pine snake is observed during construction, all work activities will cease and the snake will be allowed to leave with no support or hinderance.

Tyndall AFB will continue to follow and implement the management objectives for the Florida black bear included in the INRMP to prevent or reduce future conflicts with bears. Tyndall AFB has the capability of using a variety of techniques such as chemicals, traps, and lethal methods to control wildlife on base. Applicable federal and state permits are obtained prior to implementation of any wildlife control technique. A black bear hazing/capture permit would be one of the permits required to help manage black bear occurrences on base. Tyndall AFB also conducts preventative nuisance animal control through securing/removal of attractants (i.e., trash, pet food, bird feeders), and provides education to base residents, as resources allow (Air Force, 2019d).

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.7.2 NO ACTION ALTERNATIVE

No construction or ground disturbing activities would occur under this alternative. Therefore, the No Action Alternative would have no direct or indirect impacts either beneficial or adverse on biological resources, including federally and/or state listed species.

4.8 CULTURAL RESOURCES

4.8.1 PROPOSED ACTIONS

Section 106 consultation for the demolition of structures has been coordinated through the Florida SHPO and six Native American Tribes who have expressed an interest in Tyndall AFB. As a result of this consultation, concurrence has been received that no adverse effect on historic properties would occur under the Proposed Actions for a large portion of the buildings listed in **Appendix A**. As referenced in **Section 1.7**, in response to the Draft EA, the Seminole Tribe of Florida responded to the Draft EA with an affirmation that there may be eligible or potentially eligible historic resources within the Proposed Action areas, and requested to be involved in continuing consultations related to undertakings at Tyndall AFB, including those described in the EA. In response to the Seminole Tribe's interest in potentially eligible structures, Tyndall AFB responded to the tribe's inquiry on 26 February 2020 (**Appendix B**).

Additionally, on 13 February 2020, the SHPO responded to the EA asking for additional information on a subset of buildings to be demolished that are detailed in **Appendix A**. As with the tribes, Tyndall AFB initiated additional building-specific consultations with the SHPO on these buildings on 26 February 2020 (**Appendix B**). On 26 February 2020, Tyndall AFB responded to the SHPO regarding buildings yet to be evaluated in order to comply with Sections 106 and 110 of the NHPA (**Appendix B**). Based on evaluation of this information, SHPO has concurred as of 27 March 2020 that no adverse effects would be incurred on buildings to be demolished as a part of the recovery efforts, with the exception of Building 703. The Air Force must fully resolve all adverse effects on this structure with the SHPO prior to undertaking any demolition action on it. Post-resolution, the Air Force would be required to integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions. Within the concurrence letter, the SHPO also requested that an FMSF form documenting Buildings 3160 and 2894 be prepared and submitted for their records.

From an archaeological perspective, areas that were not previously surveyed and that are proposed for construction have been surveyed for cultural resources and no significant sites or materials were found in any of the project areas. No previously recorded cultural resources are located within the areas proposed for restoration. The Air Force has determined that cultural resources would not be adversely affected upon implementation of the Proposed Actions. The Cultural Resources Survey Report (**Appendix D**) has been submitted to the Florida SHPO for consultation under Section 106 of the NHPA. As of 27 March 2020, the SHPO has indicated that they have no further concerns on the Draft EA, including **Appendix D**.

4.8.1.1 Mitigation Measures

Pursuant to FDEP comments received on 4 March 2020, if prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the project would cease all activities involving subsurface disturbance in the vicinity of the discovery. The Air Force would contact the FDHR Compliance Review Section. Project activities would not resume without verbal and/or written authorization. In the event that unmarked human remains are encountered during permitted activities, all work would stop immediately and the proper authorities would be notified within 24 hours in accordance with Section 872.05, F.S.

4.8.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, Tyndall AFB mission capabilities and structural/infrastructural requirements would not be restored. No cultural resources would be adversely affected by the No Action Alternative.

4.9 HAZARDOUS MATERIALS/WASTE AND SOLID WASTE

4.9.1 PROPOSED ACTIONS

4.9.1.1 Hazardous Materials

Construction of the proposed new facilities would involve use of typical construction-related hazardous materials such as POL, paints, and solvents. Handling and storage of hazardous materials during construction activities, including measures to prevent releases, would be required to be conducted in accordance with all applicable environmental compliance regulations and Tyndall AFB environmental management plans. Hazardous materials or petroleum products (fuel and lubricants) would be required to be stored either double walled tanks or placed within secondary containment in order to prevent any impacts to soil or groundwater in the event of a spill. The contractor and Air Force would be required to report to the State any spills or discharges discovered during the course of demolition and construction. Management of other hazardous materials in compliance with Tyndall AFB HWMP (Air Force, 2019i) requirements and disposal of hazardous wastes as directed by the HWMP would minimize impacts from handling and disposal of hazardous substances. By following the procedures identified, impacts from hazardous and toxic substances due to the Proposed Actions would be minor.

No increases or substantial changes in current quantities and types of hazardous materials or wastes would be expected upon completion of the projects, as these activities are essentially replacing structures and functions that were operational prior to Hurricane Michael.

4.9.1.2 Hazardous Waste

Handling, storage, and disposal of hazardous waste generated during construction activities, including measures to prevent releases, would be required to be conducted in accordance with all applicable environmental compliance regulations and Tyndall AFB environmental management plans. The proposed facilities would be expected to use and manage the same type and similar amounts of hazardous materials/waste as their current facilities. Generated hazardous waste would be stored in one or more designated IAPs at Tyndall AFB in compliance with the waste containerization requirements specified in the Tyndall AFB HWMP (Air Force, 2019i). Certain wastes, such as spent air filters, may be removed

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

from the facilities during maintenance events and taken directly to the 90-day HWAS instead of being stored in an onsite IAP. Therefore, the Proposed Actions would result in no negligible effects regarding hazardous wastes.

4.9.1.3 Toxic Substances

Demolition of existing buildings as part of Project M-03 could potentially expose ACM and LBP. Surveys for ACM and LBP have been completed on 42 structures proposed for demolition. ACM was detected in 38 of these. The other four buildings were reported as non-detected for ACM. LBP was reported in eight structures and only two were reported as non-detected for LBP. The remaining structures have not been surveyed or there has only been a limited survey completed for ACM and LBP. Structures constructed after 1985 (accounting for approximately half of the buildings proposed for demolition) would be unlikely to contain ACM or LBP. As standard practice, all structures proposed to be demolished or modified at Tyndall AFB are treated as potentially containing ACM and LBP, unless surveys are completed, and no ACM or LBP are found. Tyndall AFB would conduct ACM and LBP surveys prior to demolition of previously un-surveyed structures. If ACM or LBP is encountered during demolition, BMPs in compliance with Federal and state regulations and Tyndall AFB's environmental management plans for handling and disposing of ACM and LBP would be followed, thus minimizing any impacts from the release of these contaminants to the environment. Thus, no or negligible effects relative to toxic substances would occur.

4.9.1.4 Solid Waste

Construction of the proposed structures and demolition of the damaged structures would generate nonhazardous, construction-related solid waste such as scrap metal and rubble. Projects 8500-1, F-03, SA-01, SA-02, SA-03, SA-05, SA-06, SA-07, SA-08, SA-09, and SA-10 would include demolition of a total of 1,614,863 SF of asphalt pavement parking areas and roadways. Project M-03 would demolish approximately 1,921,214 SF of buildings. **Table 4.9-1** summarizes the quantities and types of demolition debris expected to be generated from the Proposed Action. Such solid waste would be disposed at an off-base landfill or recycled/reused as appropriate. Solid waste generated during construction and demolition activities would be managed in accordance with the Tyndall AFB ISWMP (Air Force, 2019k). Therefore, minor to moderate effects relative to solid wastes at Tyndall AFB would occur due to the Proposed Action.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 4.9-1 ESTIMATED DEMOLITION DEBRIS FROM PROPOSED ACTIONS

Debris Type	Project ID (Cubic Yards)								Total
	8500-1	F-03	SA-01, SA-02, SA-03	SA-05, SA-09, SA-10	SA-06	SA-07	SA-08	M-03	
Concrete	0	0	0	0	0	0	0	541,325	541,325
Wood Products	0	0	0	0	0	0	0	244,712	244,712
Drywall and Plasters	0	0	0	0	0	0	0	86,369	86,369
Steel	0	0	0	0	0	0	0	28,524	28,524
Brick & Clay Tile	0	0	0	0	0	0	0	80,465	80,465
Asphalt Shingles	0	0	0	0	0	0	0	85,946	85,946
Asphalt Concrete	377	2,270	3,416	7,397	2,909	2,789	5,961	0	25,120
Total	377	2,270	3,416	7,397	2,909	2,789	5,961	1,067,341	1,092,461

Sources: FEMA, 2010; USEPA, 2016b.

4.9.1.5 Environmental Restoration Program

As stated in **Section 3.10.5**, a variety of IRP sites are collocated with the Proposed Actions and planned construction activities have potential to cause short-term adverse impacts to ongoing remediation activities at these sites. Refer to **Table 4.9-2** for an appraisal of likely potential impacts to each site based on the site status, as well as the planned activities associated with each of the Proposed Actions. Contractors working within IRP sites will be notified of the presence and nature of the known contaminants, access restrictions, institutional controls, and land use controls specific to the potentially impacted IRP site prior to beginning work. Pursuant to FDEP guidance, Air Force and any contractor working in or near IRP sites should communicate any questions that arise before and during field activities to the Tyndall AFB Civil Engineering Group and to the Tyndall AFB Partnering Team (Air Force, USACE, USEPA, FDEP, and associated contractors) as appropriate.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 4.9-2 POTENTIAL IMPACTS TO IRP SITES

Project Category	Project	IRP Site ID	Site Name	Site Type	Impact Assessment
2000 Area Projects	2000-1b	LF010	Capehart Marina Rubble Storage	Storage	None , NFA ROD approved by regulators
		TU202	Beacon Beach Marina	Underground Storage Tank	None , pending issuance of SRCO
	2000-1c	LF003	Beacon Beach Road Landfill	Landfill	None , IRP site has been closed by regulatory agencies
8500 Area Projects	8500-1	SR169	Jeep Range	Small Arms Range	<p>During 2013 investigations, samples were collected from various media at the sites (including soil, sediment, surface water, and groundwater) and analyzed for munitions constituents associated with small arms debris present at the site. Additionally, as part of the RI conducted from July 2015 through July 2016, samples were collected from various media at the sites. Soils, sediment, surface water, and groundwater were evaluated for metals and small arms propellants.</p> <p>As shown on Figure 1.4-2 and 1.4-2a, planned construction for this Proposed Actions may partially occur on unpaved areas requiring earthworks and ground disturbance. Therefore, there is potential for short-term, minor-to-moderate adverse impacts related to Proposed Action construction activities.</p>
	F-02	TU205	Building 239	Underground Storage Tank	Only a small portion of the Proposed Action footprint overlaps this IRP site as shown on Figure 1,4-4b . Proposed construction would occur entirely on already paved area which minimizes the potential for disturbance of any contaminated soils or other environmental media associated with this IRP site. Therefore, there is low overall potential for short-term minor adverse impacts related to Proposed Action construction activities.
	F-03	N/A	BLDG 451 Former PCP Transformer Storage	Transformer Storage	The Proposed Action footprint overlaps these IRP solid waste management units as shown on Figure 1,4-4b . Proposed construction would occur entirely on already paved area which minimizes the potential for disturbance of any contaminated soils or other environmental media associated with this IRP site. Therefore, there is low potential for short-term minor adverse impacts related to Proposed Action construction activities.
		N/A	BLDG 460 OWS	Oil/Water Separator	
		N/A	BLDG 462 WAA	Waste Accumulation Area	
F-04, F-06, F-09	OW217	Building 264/280	Oil/Water Separator	Site assessments were completed on the UST and OWS at Building 264 in 1997, 1998, 2000 and 2008. Petroleum contaminated soil was encountered during the 1996 removal of a 3,000-gallon diesel UST previously located at the east corner of Building 280. The UST was	

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Impact Assessment
					<p>removed from the site and properly disposed. A Closure Assessment Form dated December 30, 1996 was submitted to notify the FDEP of the removal of the UST, the occurrence of petroleum contaminated soil, the removal of soil, and subsequent sampling. Site assessments for Building 280 were completed in 1996 and 2000.</p> <p>As shown on Figure 1.4-4b, planned construction for these Proposed Actions may partially occur on unpaved areas requiring earthworks and ground disturbance, although most construction would occur on paved area. Therefore, there is low-to-moderate potential for short-term, minor adverse impacts related to Proposed Action construction activities.</p>
	F-07, F-08, F-09	SS026	Vehicle Maintenance Area	Spill Site Area	<p>The Proposed Action footprint overlaps these IRP sites as shown on Figure 1,4-4b. Proposed construction would occur almost entirely on already paved area which minimizes the potential for disturbance of any contaminated soils or other environmental media associated with this IRP site. Therefore, there is low potential for short-term minor adverse impacts related to Proposed Action construction activities.</p>
	F-10	N/A	Munitions Storage Area	Munitions	<p>SS520 has been closed by regulatory agencies. Only OW579, which is forecast for closure through state regulatory agencies, remains open in the MSA. Accordingly, pending further studies, it is possible that ground disturbance associated with Proposed Action construction activities could present a low-to-moderate potential for short-term, adverse impacts.</p>
Support Area Projects	SA-05, SA-09, SA-10	N/A	BLDG 934 WAA	Waste Accumulation Area	<p>As shown on Figure 1.4-6a, the overall footprint of this IRP solid waste management unit is small and planned construction activities associated with the Proposed Actions that overlap this footprint would occur entirely on already paved area which minimizes the potential for disturbance of contaminated environmental media. Therefore, there is low potential for short-term minor adverse impacts related to Proposed Action construction activities.</p>
Multi Area Projects	M-01	FT023	Former Active Fire Training Area	Fire/Crash Training Area	<p>An ongoing RI began in 2011 to address data gaps.</p> <p>Fire-fighting activities, which began at Site FT023 in 1980, may have involved the use of firefighting agents known as Aqueous Film-Forming Foams (AFFFs), which came into use as early as 1970. AFFFs are comprised of fluorocarbon surfactants and petroleum-based foam stabilizers may have contributed to the release of</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Impact Assessment
					<p>“emerging” contaminants known as perfluorinated compounds, specifically perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), into the environment.</p> <p>As shown on Figure 1.4-7a, the northernmost extent of the planned airfield drainage improvement areas intersect this IRP site, and planned construction activities would require earthworks and ground disturbance to compete. Accordingly, there is moderate-to-high potential for short-term adverse impacts related to Proposed Action construction activities.</p>
		OT004	Southeast Runway Extension Burial Site	Debris Burial	None , IRP site has been closed by regulatory agencies
		SS015	POL Area B	Spill Site Area	<p>In March 2009, approximately 1,700 tons of contaminated soils and 1.8 tons of abandoned pipelines were removed from SS015. However, an unknown quantity of contaminated soils and abandoned pipelines are still present at the site (the supplemental RI will confirm this amount), and groundwater impacts from benzene, toluene, ethylbenzene, and xylenes contamination are still present as well. In 2015 additional investigative sampling was conducted to gather updated contaminant levels and identify potential data gaps.</p> <p>As shown on Figure 1.4-7a, the planned airfield drainage improvement areas intersect this IRP site, and planned construction activities would require earthworks and ground disturbance to compete. Accordingly, there is moderate-to-high potential for short-term adverse impacts related to Proposed Action construction activities.</p>
		SS026	Vehicle Maintenance Area	Spill Site Area	<p>Soil impacts that have been identified at SS026 to date are primarily associated with aromatic and total petroleum hydrocarbon constituents, and notably lacking in VOCs. Based on historical groundwater sampling results, VOCs represent the most prevalent COPC in groundwater at SS026, occurring in varying locations and concentrations in the shallow, intermediate, and deep Surficial Aquifer. Of the VOC compounds reported, trichloroethylene and benzene are the constituents present in the highest concentrations and/or most widely distributed areas.</p> <p>As shown on Figure 1.4-7a, the planned airfield drainage</p>

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Impact Assessment
					improvement areas intersect this IRP site, and planned construction activities would require earthworks and ground disturbance to compete. Accordingly, there is moderate-to-high potential for short-term adverse impacts related to Proposed Action construction activities.
	M-02	LF003	Beacon Beach Road Landfill	Landfill	None , IRP site has been closed by regulatory agencies
		LF012	Highway 98 Burial Site	Debris Burial	None , IRP site has been closed by regulatory agencies
		OW217	Building 264/280	Oil/Water Separator	See synopsis for Projects F-04, F-06, and F-09.
		SA181	Tower Range	Storage Area	A ROD is in development to detail remedial actions. As shown on Figure 1.4-7b , the planned utility improvement areas intersect this IRP site, and planned construction activities would require earthworks and ground disturbance to compete. Accordingly, pending further studies, there is moderate-to-high potential for short-term adverse impacts related to Proposed Action construction activities.
		SR169	Jeep Range	Small Arms Range	See synopsis for Project 8500-1.
		SR170 A	Tyndall Elementary School	Small Arms Range	In May 2009, Tyndall's ERP Management Office collected soil samples around the school grounds as part of the MMRP. Results of these samples showed lead and aromatic hydrocarbon levels in certain areas at the school property were above acceptable residential screening levels. In July 2009, the Air Force removed approximately two feet of soil from the playground to the rear and adjacent areas the sides of the school and replaced the excavated soil with clean soil and new playground equipment. Another soil removal occurred in front of the school between October and November 2015 in support of a Bay County Schools project to provide driveway improvements, paved parking lots, and landscaping. A third removal action occurred in 2016. A Remedial Investigation is currently underway. As shown on Figure 1.4-7b , the planned utility improvement areas intersect this IRP site, and planned construction activities would require earthworks and ground disturbance to compete. Accordingly, there is moderate-to-high potential for short-term adverse impacts related to Proposed Action construction activities
		SS015	POL Area B	Spill Site Area	See synopsis for Project M-01.
		SS026	Vehicle Maintenance	Spill Site Area	See synopsis for Projects F-07, F-08, and F-09.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Project Category	Project	IRP Site ID	Site Name	Site Type	Impact Assessment
			Area		
		TU205	Building 239	Underground Storage Tank	See synopsis for Project F-02.
	M-03 (within/ adjacent to EA project areas)	OW040 /BLDG 188 WAA	Building 315	Oil Water/Separator	This Proposed Action involves demolition and removal of buildings on already-improved footprints. The potential for ground disturbance in a manner that would potentially disturb contaminated environmental media is low-to-negligible. Therefore, impacts to IRP sites associated with this project are low-to-negligible .
		SS015	POL Area B	Spill Site Area	
		N/A	BLDG 182 WAA	Waste Accumulation Area	
		N/A	BLDG 180 WAA	Waste Accumulation Area	
		TU204	Building 182 Former UST Site	Underground Storage Tank	
		N/A	BLDG 258 WAA	Waste Accumulation Area	
		SS026	Vehicle Maintenance Area	Spill Site Area	
		N/A	BLDG 559 WAA	Waste Accumulation Area	
		OW217	Building 264/280	Oil/Water Separator	
		TU205	Building 239	Underground Storage Tank	

Source: Tyndall AFB, 2019c

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

As summarized on **Table 4.9-2**, implementation of the Proposed Actions could affect or be affected by IRP sites. A formal construction waiver is not currently required for construction in IRP sites; however, AFCEC does require that reviews of excavation and/or construction siting and compatibility with environmental cleanup sites be conducted and documented in accordance with current EIAP processes as specified in AFI 32-7061. Through these existing EIAP processes, installations are to ensure project siting will not adversely affect environmental cleanup program activities and that there are no land use controls impacting siting and/or construction activities. If an IRP site is the only feasible location for an excavation or construction project, land use controls are to be evaluated and addressed by evaluating the project to ensure continued protectiveness for human health and the environment, and AFCEC should be consulted to ensure proper coordination and mitigation of any impacts upon cleanup site activities. If the site will be modified in such a way that a land use control no longer exists or is no longer protective, then the remedy in the IRP site's decision document would need to be revisited (Air Force, 2013).

Worker safety during construction would be required to be in compliance with OSHA safety requirements pertaining to worker exposure, and with all applicable worker safety regulations. The construction contractor would be responsible to fulfill its obligation under 29 CFR 1910.120, *Occupational Safety and Health Administration Standards, Hazardous Waste Operations and Emergency Response*, to address the health and safety of its employees during construction and demolition activities under the Proposed Actions, with respect to worker exposure to hazardous substances and proper management of soil and groundwater encountered during construction, including testing, handling, and disposal procedures. Management of soil and groundwater encountered during construction, including testing, handling, and disposal procedures would be required to be conducted in coordination with the 325 CES/CEIEC, and in accordance with Tyndall AFB protocols and all applicable environmental regulations.

Pursuant to 62-532.500(5), F.A.C., and NFWFMD requirements, the contractor and the Air Force should be aware of all monitoring wells, injection wells, extraction wells, sparge wells, and similar treatment facilities within each work area. If any of these wells are found within the area of the construction and demolition activities, they would need to be properly abandoned, as appropriate. Additionally, abandoned wells may need to be reinstalled, as necessary. The contractor and the Air Force should evaluate on a case-by-case basis if permits are needed from the Installation and NFWFMD for well abandonment and installation activities.

Due to the presence of PFOA/PFOS and pesticides in groundwater at Installation, activities that require dewatering with surface water discharge may require installing and maintaining groundwater treatment systems for contaminants of concern during dewatering operations. Additionally, work on contaminated sites may require dewatering activities of produced groundwater directly or indirectly to surface water or a conveyance connected to surface water. If groundwater produced is contaminated and does not meet surface water standards without treatment, dewatering cannot be authorized under the Generic Permit for Stormwater Discharge from Large and Small Construction Activities or the Generic Permit for Discharge of Groundwater from Dewatering Operations. These two permits are only appropriate when surface water criteria will be met without treatment. If such activities are required by the Proposed Actions, the contractor and Air Force would consult with FDEP for other permitting requirements pursuant to rules for

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

dewatering near contamination, including 62-302, F.A.C. *Surface Water Quality Standards*, 62-777, F.A.C. *Contaminated Cleanup Target Levels*, and 62-780, F.A.C. *Contaminated Site Cleanup Criteria*.

The work area for SA-11 is located near the Gulf Power substation arsenic plume boundary (**Figure 1.4-6a**). While this location is not within an IRP site, and therefore not subject to specific IRP institutional controls, other restrictions and environmental controls may apply. Construction and demolition activities adjacent to and within the Gulf Power substation arsenic plume will need to be coordinated with the FDEP Northwest District Office.

4.9.1.6 Mitigation Measures

No mitigation measures would be required. As stated above, land use controls will be evaluated and addressed by evaluating any construction activity on IRP sites to ensure continued protectiveness for human health and the environment. Additionally, AFCEC will be consulted to ensure proper coordination and mitigation of any impacts upon cleanup site activities. If an IRP site will be modified in such a way that a land use control no longer exists or is no longer protective, then the remedy in the IRP site's decision document will be revisited. If any monitoring wells, injection wells, extraction wells, sparge wells, or similar treatment facilities are found within the area of the construction and demolition activities, they would need to be properly abandoned, as appropriate. Additionally, contractors are expected to comply with all Federal and state regulations regarding removal, handling, and disposal of ACM, LBP, and other hazardous waste.

4.9.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, no hazardous, toxic or solid waste would be produced since demolition and construction activities would not occur. IRP sites would continue to be remediated.

4.10 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND THE PROTECTION OF CHILDREN

Socioeconomic and environmental justice impacts are assessed in terms of direct impacts on the local economy and related impacts on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly, depending on the location of a proposed action. A proposed action could have a significant impact with respect to the socioeconomic conditions if it were to result in at least one of the following:

- Substantial change in the local or regional economy, employment, or business volume.
- Substantial change in the local or regional population and in housing, education, installation services, or public services from the increased or decreased demands of the population change.

4.10.1 PROPOSED ACTIONS

4.10.1.1 Socioeconomic Resources

Short-term, minor, beneficial impacts on the local economy would occur from the proposed construction, demolition, and renovation projects at Tyndall AFB. These activities would stimulate the local economy

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

through the employment of construction workers and the purchase of construction-related materials and other goods and services, as well as secondary purchases of goods and services. Due to the short-term nature of construction, the economic benefits would be temporary.

The proposed construction and associated expenditures could generate additional jobs, most likely in the construction industry, but also in other industries, such as retail, that would generate additional indirect and induced income in Bay County and Panama City.

In 2017, Panama City had a civilian labor force of 15,674 people of which 851 (5.4 percent) were employed in the construction industry (U.S. Census Bureau, 2017d). It is expected that the local labor force would be sufficient to meet the demand for new jobs in the construction and other industries without a migration of workers into the area. Therefore, no impacts on population would occur as a result of the Proposed Actions because it is expected that all construction workers would be from the local or regional area.

In the event that construction workers contracted for the Proposed Actions are obtained outside of the local or regional area, the temporary increase in the workforce during the construction phase will result in a temporary increase in local housing and lodging needs for construction workers contracted at Tyndall AFB. As discussed in **Section 3.11.3**, the most recently published U.S. Census estimates (2017) show that Bay County and Panama City have housing vacancy rates of 32.3 percent and 17.5 percent, respectively. Additional, temporary lodging (hotels) and permanent housing (single-family homes, duplexes, apartments, and mobile home facilities) are currently under construction or scheduled to begin construction (see **Table 4.11-1**). Given current housing vacancy rates and the ongoing development of new housing units and temporary lodging, it is unlikely that temporary or permanent relocation of construction workers to Bay County during the construction of the Proposed Actions would exceed or cause significant impacts to the local housing supply. During construction, Tyndall AFB would evaluate the need for temporary modular housing on-installation, to further defray the impact of short-term temporary needs for construction worker housing on local housing supplies.

There would be no anticipated change to the number of personnel employed or stationed at Tyndall AFB as a result of the Proposed Actions; therefore, no significant short- or long-term impacts on demographics or social services and conditions would be expected, including demand for housing, education, law enforcement, fire protection, emergency medical services, and medical services.

4.10.1.2 Environmental Justice

Implementation of the selected projects would occur entirely on Tyndall AFB. Possible adverse effects from construction activities could include increased traffic and noise levels and decreased air quality and infrastructure capacity, but these effects would be short-term, intermittent, and minor, and would likely impact on-installation residents more than off-installation populations. The ROI has a lower percentage of residents of a racial minority than the state of Florida (16.1 percent versus 24.3 percent). Based on the reported trends, the per capita income and median household income are similar to that of Bay County, Florida, and the U.S. The Proposed Actions might have short-term, negligible to minor, adverse effects on minority and low-income populations from construction noise and traffic, decreased air quality, and infrastructure capacity; however, as stated above these would occur primarily on the base. Therefore,

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

disproportionate impacts on minority or low-income populations would not be expected. Significant impacts would not occur.

4.10.1.3 Protection of Children

Children's health and safety risks associated with implementation of the Proposed Actions would be dependent upon changes in the location, nature, tempo, or schedule of activities. Impacts would focus on compatibility of child-oriented land uses and facilities with a new operational condition, and related changes in risk exposure. Currently, no change in operational tempo or shift in operational schedule is planned as part of the Proposed Actions. Activity on base would not differ substantially from that currently supported. **Sections 4.1** and **4.2** of this document show that no significant long-term change in noise or air quality is expected to result from the implementation of the Proposed Actions.

Long-term beneficial impacts will also result from the implementation of the Proposed Actions, specifically the rebuild of child development facilities. For instance, portions of Tyndall Elementary School currently cannot be utilized due to hurricane-sustained damages; the rebuild of the school and similar facilities will restore and enhance the safety of area on base used by children.

4.10.1.4 Mitigation Measures

No mitigation would be required.

4.10.2 NO ACTION ALTERNATIVE

The No Action Alternative would not result in any additional socioeconomic or environmental justice impacts. The proposed construction, demolition, and renovation projects would not occur, and there would be no associated expenditures that would provide short-term construction employment or generate additional indirect and induced income beyond the scope of normal conditions and influences within the ROI, Panama City, or Bay County.

4.11 CUMULATIVE IMPACTS

Cumulative impacts to environmental resources result from incremental effects of proposed actions when combined with other past, present, and reasonably foreseeable future projects in the ROI. The ROI for cumulative impacts is generally limited to Tyndall AFB and the adjacent portions of Bay County, Panama City, and other municipalities. In this analysis the ROI is defined as a six-mile buffer around the Tyndall AFB property line because 1) there are no long-term operational changes anticipated due to the Proposed Actions and 2) physical impacts related to the Proposed Actions are largely confined to Tyndall AFB. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed (or anticipated over the foreseeable future) is required. This section focuses on the effects of the proposed hurricane recovery and installation development projects in concert with any reasonably foreseeable actions that are separate from the project but are expected to occur concurrently and in the same geographic extent.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

The assessment of cumulative effects begins with defining the scope of other project actions and the potential interrelationship with the proposed action (CEQ, 1997). The scope of the analysis must consider other projects that coincide with the location and timetable of implementation of the Proposed Actions. Cumulative effects can arise from single or multiple actions and through additive or interactive processes acting individually or in combination with each other. Actions that are not part of the proposal, but that could be considered as actions connected in time or space (40 CFR 1508.25) (CEQ, 1997) could include projects that affect areas on or near the Proposed Actions. This EA analysis addresses three questions to identify cumulative effects:

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

For the scenarios under consideration to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined impacts of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the impacts of the Proposed Actions must be significant. Second, the Proposed Actions must make a substantial contribution to that significant cumulative impact. Proposed actions of limited scope do not typically require as comprehensive an assessment of cumulative impacts as proposed actions that have significant environmental impacts over a large area (CEQ, 2005).

Planning efforts in the ROI include the actions described within this EA, as well as those other projects that are ongoing or planned over the short-term and medium-term timeframes. The current IDP for Tyndall AFB identifies a series of planned short-range (1-5 years), medium-range (6-10 years) and long-range (11+ years) development projects slated for military construction programming and subsequent implementation on Tyndall AFB. Notably, the IDP identifies a total of 10 short-range projects and 18 medium-range projects (Air Force, 2015a). The cumulative impacts analysis assumes that the short-range and medium-range projects identified in the IDP continue to be priorities at Tyndall AFB in addition to the hurricane recovery projects included in the Proposed Actions. Short-range projects with an assigned project number in 2015 were considered to occur in the past relative to the Proposed Actions. Short-range projects with project number to be determined (TBD) and medium-range projects with assigned project numbers were considered to occur in the present. And medium-range projects with projects number TBD were considered to occur in the future.

On 25 November 2019 the DoD published in the Federal Register a Notice of Intent to Prepare an EIS for F-35A Wing Beddown and MQ-9 Wing Beddown (Federal Register, 2019). If these new missions were to be based at Tyndall AFB, environmental impacts from the construction of needed facilities and ongoing operation of those facilities and of the aircraft would result in additional cumulative environmental effects. These potential future effects are considered in the following analysis.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

A detailed records search was performed to identify specific projects recently completed, currently underway, or planned within the next several years within the ROI by state, county, and local agencies and planning departments. Searches included online databases and websites for the City of Panama City Beach, Bay County/Panama City Public Works, Bay County Planning and Zoning Department, and FDOT (Bay County, 2019a; Bay County, 2019b; Bay County, 2019c; Panama City, 2019; FDOT, 2019).

Table 4.11-1 shows past, present, and reasonably foreseeable actions on Tyndall AFB and off-installation within the ROI that could interact with implementation of the Proposed Actions. The table briefly describes each identified action, presents the proponent or jurisdiction of each action and the timeframe (e.g., past, present, future), and indicates which resources potentially interact with the Proposed Actions. For this cumulative impacts analysis Cumulative Impacts Analysis, additional emphasis is placed on the short-range projects on **Table 4.11-1** as these projects are potentially more “foreseeable” than those on the medium-range planning horizon or more conceptual in nature.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

TABLE 4.11-1 REGIONAL PROJECTS CONSIDERED FOR CUMULATIVE IMPACTS ANALYSIS

Proponent/Location	Action	Description	Timeframe	Resource Interaction
Tyndall AFB/Flightline	Add Capabilities to MSA	As indicated by title.	Past	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Tyndall East	Construct Independent Duty Medical Technician Clinic at Silver Flag Site	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Renovate Clinic	As indicated by title.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Replace 400 Area to 6000 Area Fuel Line	As indicated by title.	Past	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct Live Ordnance Loading Area	As indicated by title.	Past	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Consolidate Chapel	As indicated by title.	Past	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Replace/Expand Building 400 for New LRS PN	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct Contractor-Owned, Contractor Operated Service Station	As indicated by title.	Past	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct Veterinary Clinic	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/All Districts	Upgrade Exterior Lighting to LED	As indicated by title.	Past	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct Fire Station	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct Passenger Terminal/Mobility Processing Center	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct Phase 1 VQ	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct Hot Pit Refueling Apron	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
				and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Extend Water to Subscale Areas	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct 6000 and 7000 Areas Information Transfer Nodes (ITNs)	As indicated by title.	Future	Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Tyndall West	Construct ITN at Fire Station in Privatized Housing	As indicated by title.	Future	Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Relocate Radar Approach Control	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct AFCEC Network Operations and Security Center	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Construct Combat Ramp	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct LRS Warehouse	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct Vehicle and Cargo Inspection Station	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Flightline	Install 9MW On-Site Generator	As indicated by title.	Future	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct Phase II VQ	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Tyndall East	Install Water Main, Silver Flag Site	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Support District	Construct Indoor Firing Range	As indicated by title.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Tyndall AFB/Tyndall West	Expand Fam Camp	As indicated by title.	Present	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
Tyndall AFB/Tyndall West	Acquire Seclusion Bay/Long Point Cove Land	As indicated by title.	Future	Land Use
Tyndall AFB/Location Unknown	EIS Pending: F-35A Wing Beddown and MQ-9 Wing Beddown	Establish new base missions for beddown of F-35A wing (96 aircraft) and beddown of MQ-9 wing (24 remotely piloted aircraft). Includes construction of needed facilities, mission HQ buildings, and operation of aircraft.	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Allanton PF Facility Building	35,100-square-foot building with parking and stormwater improvements	Past, Present	Air Quality, Noise, Land Use, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	MDC Electric	3,000-square-foot office/warehouse. 0.35 acre.	Past	Air Quality, Noise, Land Use, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Farmdale	64 lot residential subdivision. 56.2 acres.	Past	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Proposed: Mill Point Subdivision	24 lot residential subdivision. 4.5 acres.	Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Tractor Supply Company	19,097-square-foot retail store. 4.4 acres.	Present	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Canopy Place Subdivision	23-lot residential subdivision. 19.8 acres.	Past, Present	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Cedar Grove Commerce Park Lot 4	9,724-square-foot warehouse building. 1.1 acres.	Present	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Redemption Way Retreat	2,400-square-foot church retreat facility. 30.5 acres.	Past, Present	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
				Environmental Justice
Bay County Planning and Zoning	Proposed: Subway at Thomas Drive	1,822 square-foot restaurant. 1 acre.	Future	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Tidewater Creek Marina	Two private marinas/docks. 2.2 acres.	Present, Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Proposed: Palace Sands Condo	25 story condominium. 9.2 acres.	Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Half Hitch Tackle Expansion	7,000-square-foot retail expansion. 2.4 acres.	Past, Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Tidewater Creek - Phase 2	12-unit single-family residential development. 2.2 acres.	Past	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Proposed: Residential at Thomas Drive	12-lot residential duplex subdivision. 1.1 acres.	Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Cedar Grove Commerce Park Lot 3	15,000-square-foot office and warehouse facility. 1.6 acres.	Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Alezander Preserve	12-lot residential subdivision. 6 acres.	Past, Present	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Proposed: Coastal Palms Subdivision Phase 1	66-lot residential subdivision. 40.4 acres.	Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Proposed: Dat Cajun Place	7,000-square-foot restaurant. 3 acres.	Future	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Highway 231 FSER	11,796-square-foot medical facility. 2.3 acres.	Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
Bay County Planning and Zoning	7209 Laird Street Office/Warehouse	23,840-square-foot office and warehouse. 2.7 acres.	Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Magnolia Ridge	134-lot residential subdivision. 44 acres.	Past, Present	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Tudor's Biscuit World & Retail	2,800-square-foot restaurant, 3,500-square-foot retail center. 1.3 acres	Past, Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	104 Thomas Drive Warehouse	4,200-square-foot warehouse building. 0.9 acres.	Past, Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Dever Office Building	5,660-square-foot office building. 0.4 acres.	Past, Present	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Planning and Zoning	Panama City Beach Sports Park	13-field multi-use sports park facility. 210 acres.	Past	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Bay County Courthouse Post Hurricane Repairs	Exterior and interior post-hurricane repairs for Bay County Courthouse.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Hurricane Repairs, State Attorney - Public Defender's Office	Exterior and interior post-hurricane repairs for State Attorney's office building.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Library Hurricane Repairs	Exterior and interior post-hurricane repairs to Bay County Public Library.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Hurricane Repairs, Construction Bay County Junior Deputies	Exterior and interior post-hurricane repairs for Bay County Junior Deputies office.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Hurricane Repairs, Bay Co Health Department	Exterior and interior post-hurricane repairs for Florida State Department of Health, Bay County.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Frankford Avenue Sidewalk	Resurface Frankford Avenue and add curb and gutter with a six-foot sidewalk along both sides of	Present, Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
		Frankford Avenue, from 23rd Street to SR 390. The project will consist of earthwork operations, replacement of existing cross drain, paving, and stabilization of all disturbed areas.		Environmental Justice
Bay County Public Works	County Road (CR) 2297 Bridge Replacement	Replace bridge over Laird Bayou.	Present, Future	Air Quality, Noise, Land Use, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Hurricane Repairs, Sheriff's Office	Exterior and interior post-hurricane repairs for Bay County Sheriff's Office.	Present	Air Quality, Noise, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
Bay County Public Works	Water Treatment Plant Roadway Paving & Improvements	Roadway improvements at the Bay County Water Treatment Plant. The project will consist of earthwork operations, asphalt paving, compacted gravel, concrete paving, asphalt milling and resurfacing, and stabilization of all disturbed areas.	Present, Future	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	U.S. 98 at the intersection of Airey Avenue and Tyndall Drive	New intersection configuration to separate Tyndall AFB traffic from through traffic, and an overpass to improve on-base traffic flow. Interchange - Add Lanes	Present, Future	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	U.S. 98 (Tyndall Parkway) Resurfacing	Milling and resurfacing SR 30A (U.S. 98 / Tyndall Parkway) from CR 2327 (Transmitter Road) in Bay County. Also included is guardrail, additional sidewalk, driveways, signing, pavement markings and minor drainage improvements.	Present, Future	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	Proposed: SR 22 Wewa Highway from U.S. 98B to Star Avenue	Widen the roadway to a four-lane urban section, with curb and gutter, and a raised landscaped median. Bike lanes and sidewalks are also provided in each direction to accommodate the pedestrian users along the corridor. The four-lane	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
		section will include exclusive left-turn lanes located at major intersections and driveway connections, consistent with access class 5 and a single-lane left-turn flyover from southbound Tyndall Parkway to eastbound Wewa Highway.		
FDOT	SR 390 from east of CR 2312 to Jenks Avenue	Multi-lane reconstruction project primarily consists of widening SR 390 (St. Andrews Boulevard) from CR 2312 (Baldwin Road) to Jenks Avenue. The typical section will consist of six 12-foot travel lanes separated by a 22-foot median with curb and gutter, four-foot bicycle lanes and curb and gutter on the outside. Six-foot sidewalk will be constructed along both sides of the roadway adjacent to the curb and gutter.	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	SR 390 from 23rd Street to east of Baldwin Road	Widening SR 390 (St. Andrews Boulevard) from two to six lanes, constructing drainage improvements, adding dedicated bicycle lanes, sidewalks, and Americans with Disabilities Act accessibility improvements.	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	SR 368A Collegiate Drive from west of Moody Avenue to 23rd Street	Widen Collegiate Drive from west of Moody Avenue to 23rd Street for the addition of bike lanes. Existing travel lanes, auxiliary lanes, and paved shoulders will be resurfaced.	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	23rd Street Flyover Project	Intersection improvement project on SR 30 (U.S. 98) at SR 368 (23rd Street) in Panama City. Add Lanes and Reconstruct.	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	U.S. 231 from SR 368 23rd Street to south of	Widen 5.5 miles of U.S. 231 from four to six lanes with bike lanes,	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
	Pipe Line Road	sidewalks, and drainage improvements. Approximately 1.6 miles of Segment 7, from U.S. 98 (15th Street) to north of SR 368 (23rd Street), includes adding flyover ramps on U.S. 98 at the intersection of U.S. 231 and on SR 77 (Martin Luther King, Jr. Boulevard) over U.S. 231. Martin Luther King, Jr. Boulevard will be widened from four to six lanes from East 23rd Street to 15th Street. It will bridge over U.S. 231 and the Bay Line Railroad.		and Waste, Socioeconomics and Environmental Justice
FDOT	Front Beach Road from East Lakeshore Drive to Portside Drive	Construct sidewalks along both sides of SR/CR 30 (Front Beach Road) from East Lakeshore Drive to Portside Drive.	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	SR 390 from Jenks Avenue to SR 77	Multi-lane reconstruction project on SR 390 from Jenks Avenue to Indiana Avenue in Bay County. Improvements include widening 1.5 miles of the existing roadway from two to six-lanes while adding medians, buffered bicycle lanes and sidewalks, water quality and treatment facilities, and a closed drainage system. The widening of SR 390 east of SR 77 will facilitate the transition to the existing two-lane roadway. A new pedestrian overpass will be built above the six-lane roadway at Mowat Middle School.	Present, Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice
FDOT	Proposed: Gulf Coast Parkway	Proposed Gulf Coast Parkway will provide a connection between U.S. 98 in Gulf County with U.S. 231 (north of Panama City) and U.S. 98 in Bay County. Four-lane divided,	Future	Air Quality, Noise, Soils, Water Resources, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Proponent/Location	Action	Description	Timeframe	Resource Interaction
		controlled-access, arterial highway.		
Panama City Beach Public Works	Front Beach Road Segment 2	Jackson Boulevard to South Thomas Drive Public transit system. Pedestrian and bicycle improvements.	Present, Future	Air Quality, Noise, Soils, Water Resources, Hazardous Materials and Waste, Socioeconomics and Environmental Justice

Sources: Air Force, 2015a; Federal Register, 2019; Bay County, 2019a; Bay County, 2019b; Bay County, 2019c; FDOT, 2019; Panama City, 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

The following sections evaluate the cumulative effects from the past, present, and reasonably foreseeable future actions presented in **Table 4.11-1** above. **Table 4.11-2** below provides a summary of the cumulative effects. No significant adverse cumulative impacts are expected to result from the Proposed Actions when considered with other reasonably foreseeable actions within the ROI.

TABLE 4.11-2 SUMMARY OF CUMULATIVE IMPACTS

Resource Area	Proposed Actions	Past, Present, and Foreseeable Actions	Cumulative Effects
Air Quality	■	■	■
Noise	■	■	■
Safety and Health	■	■	■
Land Use	○	■	○
Soils	■	■	■
Water Resources	■	■	■
Biological Resources	○	■	○
Cultural Resources	■	■	■
Hazardous Materials and Waste	■	■	■
Socioeconomics and Environmental Justice	○	■	○

Notes: ○ – Not affected or beneficial impacts, ■ - Affected but not significant, short to medium term, impacts that range from low to high intensity
● – Significant impacts, that are high in intensity or are long term.

4.11.1 AIR QUALITY

4.11.1.1 Proposed Actions

The Proposed Actions’ air quality impacts would be largely constrained to the facilities construction period occurring between years 2020-2025. The multi-year time frame anticipated for construction activities would correspond with other regional construction and development projects occurring in the ROI. Construction of each of the Proposed Actions would have some degree of adverse effect on air quality; accordingly, impacts of overlapping projects are anticipated. However, operational and construction-related annual emissions associated with the Proposed Actions are well beneath the applicable CAA *de minimis* thresholds for all pollutants. Construction-related emissions of other pollutants and GHGs are similarly within Air Force significance thresholds. Operational emissions are expected to be comparable to existing emission rates. However, the conservative analysis that considers operational emissions as additional to existing emissions demonstrates that under a worst-case scenario such emissions would be well below applicable thresholds on an ongoing basis. Overall, based on these emissions levels, significant cumulative impacts to air quality resulting from the Proposed Actions are not anticipated.

4.11.1.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur, no temporary construction emissions would occur, and there would be no associated contribution to cumulative impacts to air quality.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.11.2 NOISE

4.11.2.1 Proposed Actions

Construction-related noise would be temporary, while none of the projects considered would have an impact on operations-related noise activities. Cumulative noise levels are not expected to substantially change the noise contours currently experienced within the region of Tyndall AFB. Future projects, such as the proposed beddown of F-35A and MQ-9 wings, could change noise contours at Tyndall AFB. However, impacts to noise from the Proposed Actions would not add or contribute to possible future impacts from those other projects. Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects would not contribute to adverse cumulative impacts on the noise environment.

4.11.2.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts to noise.

4.11.3 SAFETY AND OCCUPATIONAL HEALTH

4.11.3.1 Proposed Action

Short-term, negligible, adverse cumulative impacts on health and safety (e.g., slips, falls, heat exposure, exposure to mechanical, electrical, vibration, chemical hazards) could occur from construction, demolition, maintenance, and repair activities associated with the Proposed Actions and other planned actions occurring at the installation. Construction workers could also encounter soil or groundwater contamination as a result of an IRP site or previously unknown soil or groundwater contamination. However, implementation of appropriate safety methods and following OSHA and AFOSH safety standards during these activities would minimize the potential for such impacts. With these protocols in place, health and safety risks from all planned projects, and when considered cumulatively, would be reduced to acceptable levels. The removal of ACM, LBP, and PCB-contaminated materials, and other planned actions that improve safety would result in a long-term, beneficial impact on safety and occupational health for personnel and residents at Tyndall AFB, which would offset some health and safety risks associated with past and present actions on the installation. Therefore, no significant cumulative impacts to safety and occupational health are anticipated.

4.11.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts relative to health and safety.

4.11.4 LAND USE

4.11.4.1 Proposed Actions

No impacts to land use are anticipated from the Proposed Actions. Implementation of the proposed installation development projects will accomplish future development expectations for long-range

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

planning and land use as described in the Tyndall AFB IDP and Master Plan. The Proposed Actions are consistent with the Tyndall AFB IDP and the planning goals established in the future land use plan. The future land use plan for Tyndall AFB considers land use compatibility, facility consolidation, mission sustainability, quality of life, safety and security. A major emphasis of the installation's long-range facility development plan is to consolidate land uses and collocate similar functions. Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects, would not contribute to adverse cumulative impacts on land use.

4.11.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts on land use.

4.11.5 SOILS

4.11.5.1 Proposed Actions

Demolition and construction activities would directly disturb approximately 1,164 acres of native and non-native soils, over half of which (approximately 629 acres) would result from the Flightline drainage improvement and utility upgrade projects. None of the soils affected are considered as prime or unique farmland soils and all are locally or regionally common. Other construction activities in the region proposed by the county, city or state governments, as well as commercial and private developers would also remove soils from biological productivity. Tyndall AFB would be required to obtain a Stormwater Construction Permit from the FDEP prior to construction. The construction contractor would be required to develop a SWPPP specific to each site. that would detail erosion prevention and control measures to be implemented during site preparation and construction activities Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects would result in a minor contribution to adverse cumulative impacts on the regional soils.

4.11.5.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts on soils.

4.11.6 WATER RESOURCES

4.11.6.1 Proposed Actions

Construction activities would impact up to 134.9 acres of wetlands, and 120,300 LF (i.e., drainage features) and 15.8 acres (stormwater pond/open water/drainage features) of other surface waters. During design and permitting, efforts will be made to minimize impacts to wetlands and other surface waters to the greatest extent practicable. Mitigation measures would be implemented to minimize impacts to wetlands and other surface waters, in compliance with EO 11990 and Section 404 of the CWA. There would be a permanent loss of floodplain functions due to the construction activities. Given the amount of restoration-related construction ongoing in Bay County, other impacts to floodplains are likely as well, although these impacts will be minimized through state and local building ordinances regarding

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

floodplains. The construction activities will essentially replace those facilities that were damaged by Hurricane Michael. On 4 March 2020 FDEP issued a concurrence that there would be no increase in long-term impacts to coastal resources from the Proposed Actions, and therefore that the Proposed Actions are consistent with the FCMP. No long-term impacts on surface waters and groundwater were identified. Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects would result in minor contributions to adverse cumulative impacts on water resources, primarily wetlands and floodplain functions.

4.11.6.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts relative to water resources.

4.11.7 BIOLOGICAL RESOURCES

4.11.7.1 Proposed Action

Construction activities would impact potential wildlife habitat; however, most of these areas have been previously disturbed by development or timber harvesting/salvage operations. Wildlife occupying these habitats would be affected, but the effects are considered minor and would not adversely affect the population viability. Some individual telephus spurge specimens will be lost; however, the Air Force and USFWS have identified the proper conservation measures to offset these impacts through Section 7 consultation. Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects would result in minor contributions to adverse cumulative impacts on biological resources.

4.11.7.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts relative to biological resources.

4.11.8 CULTURAL RESOURCES

4.11.8.1 Proposed Actions

Demolition and construction activities would not impact any significant historic properties. Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects would not contribute to adverse cumulative impacts on cultural resources.

4.11.8.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts relative to cultural resources.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

4.11.9 HAZARDOUS MATERIALS AND WASTE

4.11.9.1 Proposed Actions

Demolition and construction activities would increase the use and storage of hazardous materials (e.g., solvents, paints, adhesives, etc.) at Tyndall AFB for the short-term. Some short-term increases would be realized in terms of the quantity of fuel used during construction activities for these actions. Demolition would increase the amount of hazardous wastes generated, but these activities would last for less than five years and all wastes would be disposed of properly. No increases or substantial changes in current quantities and types of hazardous materials or wastes would be expected upon completion of the projects, as these activities are essentially replacing structures and functions that were operational prior to Hurricane Michael. No change in aircraft operations or use of motor vehicles at the installation would be expected, and therefore, throughput of petroleum substances and hazardous waste streams would not increase. Operations-related hazardous waste generation (e.g., used oil, used filters, oily rags, etc.) would continue to be managed in accordance with the installation's HWMP and all applicable Federal, state, and local regulations. Given the amount of restoration-related construction ongoing in Bay County, other hazardous waste and construction debris will be generated for the foreseeable future. It is expected that these wastes will also be properly disposed.

A variety of IRP sites are collocated with the Proposed Actions and planned construction activities have potential to cause short-term adverse impacts to ongoing remediation activities at these sites. As summarized on **Table 4.9-2**, implementation of the Proposed Actions could affect or be affected by IRP sites. Construction or excavation work within IRP sites must be coordinated with AFCEC and any applicable land use controls are to be evaluated and addressed by evaluating the project to ensure continued protectiveness for human health and the environment. Additionally, contractors are expected to comply with all Federal and state regulations regarding removal, handling, and disposal of ACM, LBP, and other hazardous waste. Worker safety during construction would be required to be in compliance with OSHA safety requirements pertaining to worker exposure, and with all applicable worker safety regulations.

Therefore, the Proposed Actions, when combined with other past, present, and reasonably foreseeable projects would result in minor contributions to adverse cumulative impacts on hazardous materials/waste and solid waste.

4.11.9.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative impacts relative to hazardous wastes.

4.11.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.11.10.1 Proposed Actions

Cumulatively, the Proposed Actions and other actions that would occur over the next five years would have short-term, minor to moderate, beneficial effects in the ROI, Panama City and Bay County through the increased demand for construction workers and the procurement of goods and services. Construction-

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

related expenditures would not be expected to generate long-term cumulative socioeconomic benefits. In the event that construction workers contracted for the Proposed Actions are obtained outside of the local or regional area, the temporary increase in the workforce during the construction phase will result in a temporary increase in local housing and lodging needs. Because the Proposed Actions would not result in a long-term increase in the installation or regional population, they would not contribute to cumulative demographic impacts in the region.

Because the Proposed Actions would not result in disproportionately high and adverse impacts on environmental justice populations, they would not contribute to cumulative environmental justice impacts in the region.

4.11.10.2 No Action Alternative

Under the No Action Alternative, the Proposed Actions would not occur and there would be no associated contribution to cumulative socioeconomic or environmental justice impacts.

This page intentionally left blank.

5.0 MITIGATION MEASURES AND REQUIRED PERMITS

Wetlands

Compensatory wetland mitigation will be required to offset impacts to state and/or federally jurisdictional wetlands. The mitigation requirements will be identified through the state and Federal permitting process. Tyndall AFB is located within the St. Andrew Bay watershed. Currently, there is one wetland mitigation bank (Horseshoe Creek Mitigation Bank) that services this watershed and is pending state and Federal permits to eventually have freshwater herbaceous, freshwater forested, and saltmarsh wetland credits available. Representatives of the bank anticipate credits will be released for purchase in March 2020 pending state and Federal approvals.

A CWA Section 404 permit and a Section 401 water quality certification would be required prior to any dredge and/or fill actions within federally jurisdictional wetlands. An ERP would be required from the FDEP/NFWMD for any impacts to state jurisdictional wetlands. Florida's ERP program regulates activities in uplands that generate stormwater runoff or otherwise alter surface water flows. Per these regulations, activities that increase the imperviousness of a given area require an ERP from the FDEP or Water Management District (i.e., NFWMD), unless they qualify to be exempted; affected areas less than 4,000 SF are exempt from permitting. Based on preliminary design, the total amount of impervious area that would be created from construction of the proposed facilities would far exceed that threshold and require an ERP.

An NPDES stormwater construction permit is required from the FDEP for any proposed project in Florida that would disturb one acre or more of land. As part of this permit, the proponent of the project is required to prepare and implement a SWPPP, which outlines the BMPs and engineering controls to be used to prevent and minimize erosion, sedimentation, and pollution during construction.

Floodplains

Drainage system improvements associated with the Proposed Actions would be designed to properly convey and store stormwater flows, and would not impede floodwater flows during major storm events. The Proposed Actions' design would comply with local floodplain management policies and regulations, which promote designs to minimize flood impacts. Adverse effects could be further minimized by elevating all facilities above the BFE, applying construction period erosion and sedimentation controls, and using pervious surfaces for stormwater retention and treatment where possible.

To minimize impacts to and within floodplains, design elements will be incorporated into the individual projects that would encroach on floodplains. In general, building footprints would be reduced as much as possible to minimize encroachments into the floodplain. Other design elements could include constructing buildings on land elevated above the BFE through placement of fill; establishing basement elevations and first floor elevations consistent with potential flood levels; and elevating utilities and equipment that might be hazardous to life if submerged. To minimize loss of floodplain storage and function, compensatory storage will be provided by excavating material within or adjacent to the same floodplain

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

to be used as fill, in a manner that does not disturb or impact wetlands, endangered vegetation, or potential cultural sites.

Biological Resources

All potential staging areas will be surveyed and evaluated for potential impacts to protected wildlife and listed species prior to clearing and development. Species-specific wildlife surveys will be conducted at the appropriate time of the year prior to development activities and will follow established survey protocols approved by the USFWS and the FWC. All wildlife surveys will be conducted by qualified biologists with recent documented experience for each potential species prior to all clearing and development activities.

To reduce the potential of shorebirds nesting during construction, construction and/or demolition activities will be conducted outside of the breeding season; sites will only be cleared when ready to build; cleared areas that could become potential nesting sites will not be left for an extended amount of time; and proposed work sites will be monitored during the nesting season prior to clearing, demolition, or construction activities to ensure no active nests are present. If nesting is observed within or adjacent to a demolition or construction work site prior to or after the start of work, coordination with the FWC will be implemented to discuss nest buffers and other avoidance and minimization measures

Within 30 days of ground disturbance, Tyndall Natural Resources would complete a gopher tortoise (*Gopherus polyphemus*) survey at and in the vicinity of the construction sites. If any found burrows cannot be avoided by 25 feet, the tortoises and any commensal species would be relocated in accordance with Tyndall AFB's *Threatened and Endangered Species Component Plan* (Air Force, 2018b) and FWC's current guidelines. If gopher tortoises are in close proximity to the construction site, silt fencing or some other type of barrier would be erected to keep tortoises from moving into the construction area after surveys have been completed.

Any new lighting systems will be designed to avoid or reduce illumination effects on sea turtles. The Air Force and USFWS have determined appropriate conservation measures to offset impacts on telephus spurge populations through Section 7 consultation. As identified by completion of Section 7 consultation with USFWS, telephus spurge populations will be avoided at project areas, if practicable, or salvage/relocation/enhancement of the affected populations would occur.

If a Florida pine snake is observed during construction, all work activities will cease and the snake will be allowed to leave with no support or hinderance.

Tyndall AFB will continue to follow and implement the management objectives for the Florida black bear included in the INRMP to prevent or reduce future conflicts with bears. Tyndall AFB has the capability of using a variety of techniques such as chemicals, traps, and lethal methods to control wildlife on base. Applicable federal and state permits are obtained prior to implementation of any wildlife control technique. A black bear hazing/capture permit would be one of the permits required to help manage black bear occurrences on base. Tyndall AFB also conducts preventative nuisance animal control through securing/removal of attractants (i.e., trash, pet food, bird feeders), and provides education to base residents, as resources allow (Air Force, 2019d).

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Cultural Resources

Pursuant to FDEP guidance received on 4 March 2020, if prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the project would cease all activities involving subsurface disturbance in the vicinity of the discovery. The Air Force would contact the FDHR. Project activities would not resume without verbal and/or written authorization. In the event that unmarked human remains are encountered during permitted activities, all work would stop immediately and the proper authorities would be notified within 24 hours in accordance with Section 872.05, F.S. Any immediate measures necessary to protect and evaluate the inadvertent find would be also implemented in accordance with the Tyndall AFB ICRMP (Air Force, 2016a).

As indicated in previous sections, the SHPO has concurred with the Air Force's determination that the Proposed Actions would constitute no adverse effect on historic properties, with the exception of Building 703. The Air Force must fully resolve all adverse effects on this structure with the SHPO prior to undertaking any demolition action on it. Post-resolution, the Air Force would be required to integrate any required actions into the Mitigation Monitoring Plan for the Proposed Actions. Within the concurrence letter, the SHPO also requested that an FMSF form documenting Buildings 3160 and 2894 be prepared and submitted for their records.

Hazardous Materials

Prior to demolition of the all buildings, Tyndall AFB would conduct ACM and LBP surveys of each structure. Any encountered ACM or LBP would be remediated and disposed of in accordance with Tyndall AFB's environmental management plans and in compliance with all applicable regulations.

Worker safety during construction would be required to be in compliance with OSHA safety requirements pertaining to worker exposure, and with all applicable worker safety regulations. The construction contractor would be responsible to fulfill its obligation under 29 CFR 1910.120 to address the health and safety of its employees during construction and demolition activities under the Proposed Actions, with respect to worker exposure to hazardous substances and proper management of soil and groundwater encountered during construction, including testing, handling, and disposal procedures. Management of soil and groundwater encountered during construction would be required to be conducted in coordination with the 325 CES/CEIEC, and in accordance with Tyndall AFB protocols and all applicable environmental regulations. If any potential munitions and explosives of concern is encountered during construction or demolition activities, the construction contractor would be required to immediately stop work and notify the 325 CES/CEIEC.

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

6.0 LIST OF PRIMARY PREPARERS

The following persons were primarily responsible for preparation of this EA:

Name	Firm	Primary Responsibility
Chris Ingram	Gulf South Research Corporation	Project Manager
Dennis Peters	Gulf South Research Corporation	Deputy Project Manager
Paul Sanford	AECOM	Project Manager, DOPAA Preparation, Air Quality, Hazardous Materials
Carrie Kyzar	AECOM	Land Use, Hazardous Materials
Tia Norman	AECOM	Socioeconomics and Environmental Justice, Wetlands, Biological Resources, Water Resources
Dan Botto	AECOM	Noise
Sam Hartsfield	AECOM	Air Quality, Health and Safety, Coastal Resources, Soils, Water Resources
Bob Morris	AECOM	AutoCAD
Josh McEnany	Gulf South Research Corporation	Wetlands
Sean Graham	Gulf South Research Corporation	Wetlands
AJ Pate	Gulf South Research Corporation	Wetlands
Rob Nixon	Gulf South Research Corporation	Biological Resources
Lauren Solomon	Gulf South Research Corporation	Soils, Water Resources
Christy Guemple	Gulf South Research Corporation	GIS
Ross Hackbarth	Gulf South Research Corporation	GIS

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

7.0 LIST OF PERSONS CONSULTED

Lt Col Mike Askegren, Tyndall AFB	Maj Patrick Milott, AFLOA
Donna Barber, Tyndall AFB	Cynthia Pettit, AFCEC
Maj Peeter Pleake-Tam, Tyndall AFB	Sarah Amthor, AFIMSC
Jose Cintron, Tyndall AFB	Melanie Kaeser, USFWS/Tyndall
Edwin Wallace, Tyndall AFB	Crystal Darnell, USACE Mobile
Alex Bonner, Tyndall AFB	Katie Roland, USACE Mobile
Brian Stahl, Tyndall AFB	Dr. Sean M. Blomquist, USFWS, Panama City, Florida
Traycee Chapman, Tyndall AFB	Mr. Chris Stahl, Office of Intergovernmental Coordination Programs, FDEP, Tallahassee, Florida
Mr. Mark Young, Tyndall AFB	Dr. Timothy A. Parsons, FDHR, Tallahassee, Florida
Ms. Lisa Fowler, Tyndall AFB	Ms. Stephanie A. Bryan, Poarch Band of Creek Indians, Atmore, Alabama
Mr. Miguel Plaza, Tyndall AFB	Mr. Gregory Chilcoat, Seminole Nation of Oklahoma, Wewoka, Oklahoma
Mr. Michael Simons, Tyndall AFB	Mr. Billy Cypress, Miccosukee Tribe of Indians of Florida, Miami, Florida
Mr. Rockford Johnson, Tyndall AFB	Mr. James Floyd, Muscogee (Creek) Nation, Okmulgee, Oklahoma
Rocky Johnson, Tyndall AFB, Florida	Mr. Marcellus Osceola Jr. Seminole Tribe of Florida, Hollywood, Florida
Benjamin Aubuchon, Eglin/Tyndall AFB	Mr. Ryan Morrow, Thlopthlocco Tribal Town, Okemah, Oklahoma

This page intentionally left blank.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

8.0 REFERENCES

10 U.S. Code §2802 – *Military Construction Projects*

15 U.S. Code §§2601-2671 – *Toxic Substances Control Act*

16 U.S. Code §§703-712 – *Migratory Bird Treaty Act*

16 U.S. Code §1451 et seq. – *Coastal Zone Management Act*

16 U.S. Code §1531 et seq. – *Endangered Species Act of 1973, as amended*

29 U.S. Code §651 et seq. – *Occupational Safety and Health Act, as amended*

33 U.S. Code §403 – *River and Harbors Act of 1899*

33 U.S. Code §1344 et seq. – *Clean Water Act (Section 404)*

42 U.S. Code §300f et seq. – *Safe Drinking Water Act*

42 U.S. Code § 4321 – *National Environmental Policy Act, as amended*

42 U.S. Code §4231 – *Intergovernmental Cooperation Act of 1968*

42 U.S. Code §4901 et seq. – *Noise Control Act*

42 U.S. Code §6901 et seq. – *Resource Conservation and Recovery Act, as amended*

42 U.S. Code §7401 et seq. – *Clean Air Act, as amended*

42 U.S. Code §7408 – *Air Quality Criteria and Control Techniques*

42 U.S. Code §7409 – *National Primary and Secondary Ambient Air Quality Standards*

42 U.S. Code §9601 et seq. – *Comprehensive Environmental Response, Compensation, and Liability Act*

42 U.S. Code §§11001-11050 – *Emergency Planning and Community Right-to-Know-Act*

42 U.S. Code §17001 et seq. – *Energy Independence and Security Act*

54 U.S. Code §300101 et seq. – *National Historic Preservation Act, as amended*

54 U.S. Code §300308 – *Historic Property*

AECOM, 2019. Tyndall Air Force Base Recovery Plan and Analysis of Alternatives Report. Prepared for Air Force Engineer Center. July 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Bailey, Robert G., 1995. Description of the Ecoregions of the United States. Second edition revised and expanded (first edition 1980). Miscellaneous Publication Number 1391, Washington, DC: U.S. Forest Service. 108 pp.
- Bartlett, Laurel, Elizabeth, Chambliss, Melissa Dye, Kyle Coxen, Benjamin Roberts and Jessica Fish, 2015. *Cultural Resource Assessment Survey for the SR 30 (U.S. 98) Alternative 7 Elevated Roadway at Tyndall AFB Entrance Bay County, Florida*. Report prepared for the Federal Highway Administration, Tyndall Air Force Base, and the Florida Department of Transportation, District 3. SEARCH, Inc., Project No. 2932-13016.
- Bay County, 2019a. Monthly Capital Projects Report. Published 10 December 2019 by Bay County, Florida. Available Online at: <https://www.co.bay.fl.us/DocumentCenter/View/4619/Capital-Projects-Report-December-2019>.
- Bay County, 2019b. Projects Issued. Bay County, Florida Planning and Zoning Division. 12 December 2019. Available Online at: <https://www.baycountyfl.gov/DocumentCenter/View/4631/Projects-Issued-12-12-19>.
- Bay County, 2019c. Projects Under Review. Bay County, Florida Planning and Zoning Division. 12 December 2019. Available Online at: <https://www.baycountyfl.gov/DocumentCenter/View/4653/Projects-Under-Review-12-19-19>.
- Bay District Schools, 2019. Military Families. Available at: <http://www.bay.k12.fl.us/military>. Accessed 14 October 2019.
- Campbell, Janice L. and Prentice M. Thomas Jr., 1985. *Cultural resources investigation at Tyndall Air Force Base, Bay County, Florida*. New World Research, Inc. Report of Investigations 84-4.
- City of Panama City Beach (Panama City), 2019. Fiscal Year 18/19 Capital Improvements Schedule for City of Panama City Beach. Accessed December 2019 from: <http://www.pcbgov.com/departments-services/planning-department/informational-materials>.
- Council on Environmental Quality (CEQ), 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. January 1997.32
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services. Technical Publication USFWS/OBS- 79/31. 131 pp.
- CEQ, 2005. Memorandum from CEQ to Heads of Federal Agencies, Subject: Guidance on the Considerations of Past Actions in Cumulative Effects Analysis. 24 June 2005.
- Executive Order 11988 – *Floodplain Management*. 42 FR 26951. 24 May 1977
- Executive Order 11990 – *Protection of Wetlands*. 42 FR 26961. 24 May 1977

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

Executive Order 12196 – *Occupational Safety and Health Programs for Federal Employees*. 45 FR 12769. 265 February 1980.

Executive Order 12372 – *Intergovernmental Review of Federal Programs*. 47 FR 30959. 14 July 1982.

Executive Order 12898 – *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. 59 FR 7629. 16 February 1994.

Executive Order 13045 – *Protection of Children from Environmental Health Risks and Safety Risks*. 62 FR 19885. 23 April 1997

Executive Order 13175 – *Consultation and Coordination with Indian Tribal Governments*. 65 FR 67249. 9 November 2000.

Federal Emergency Management Agency (FEMA), 2010. *Debris Estimating Field Guide, FEMA 3239*. September 2010.

Federal Emergency Management Agency (FEMA), 2019. Flood Zones. Internet URL: <https://www.fema.gov/flood-zones>.

Federal Register, 2019. Notice of Intent to Prepare an Environmental Impact Statement for F-35A Wing Beddown and MQ-9 Wing Beddown. Vol. 84, No. 227. Notices, pg. 64867. Monday, 25 November 2019.

Florida Administrative Code, 1994. Chapter 62-340, F.A.C. *Delineation of the Landward Extent of Wetlands and Surface Waters*.

Florida Administrative Code, 2003. Chapter 62-604, F.A.C. *Collection Systems and Transmission Facilities*.

Florida Administrative Code, 2014. Chapter 62-555, F.A.C. *Permitting, Construction, Operation, and Maintenance of Public Water Systems*.

Florida Administrative Code, 2015. Chapter 68A-4.009, F.A.C. *Florida Black Bear Conservation*.

Florida Administrative Code, 2016. Chapter 62-345, F.A.C. *Uniform Mitigation Assessment Method*.

Florida Administrative Code, 2019. Chapter 68A-27, F.A.C. *Rules Relating to Endangered or Threatened Species*.

Florida Climate Center, 2019. Florida State University. Panama City 1981-2010 Normals. <https://climatecenter.fsu.edu/products-services/data/1981-2010-normals/panama-city>. Accessed 14 October 2019.

Florida Department of Agriculture and Consumer Services (FDACS), 2010. *Notes on Florida's Endangered and Threatened Plants*. Botany Section Contribution No. 38, 5th edition. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, 2010.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Florida Department of Environmental Protection (FDEP), 2015. Air Permit No. 0050024-016-AF. 30 September 2015.
- FDEP, 2018. FDEP History of Emissions, United States Air Force - Tyndall AFB. <http://prodenv.dep.state.fl.us/DarmAircom/public/showPIFacEmissionInfoAction.action>. Accessed 14 October 2019.
- FDEP, 2019. Statewide Comprehensive Verified List of Impaired Waters. Internet URL: <https://floridadep.gov/dear/watershed-assessment-section/content/assessment-lists>.
- FDOT, 1999. Florida Land use, Cover and Forms Classification System (FLUCFCS). Third Edition. Florida Department of Transportation Surveying and Mapping Office, Geographic Mapping Section. January 1999.
- FDOT, 2019. Northwest Florida Roads, Current Projects. Accessed December 2019 from <https://nwflroads.com/currentprojects>.
- Florida Division of Historical Resources (FDHR), 2003 Cultural Resource Management Standards and Operational Manual. Florida Division of Historical Resources, Tallahassee.
- Florida Fish and Wildlife Conservation Commission (FWC), 2019a. Snowy Plover Species Profile. Accessed on 4 January 2020 from <https://myfwc.com/wildlifehabitats/profiles/birds/shorebirdsseabirds/piping-plover/>.
- FWC, 2019b. *Florida Black Bear Management Plan*. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, 209 p.
- Florida Statutes, Part II, Chapter 380, F.S. – *Coastal Planning and Management*.
- Florida Statutes, Part IV, Chapter 373, F.S. – *Management and Storage of Surface Waters*.
- Godfrey, R.K. and J.W. Wooten, 1981. Aquatic and Wetland Plants of the Southeastern United States (Dicotyledons). The University of Georgia Press, Athens, Georgia.
- Kaesler, M., 2018. Personal Observation. U.S. Fish and Wildlife Service, Tyndall AFB.
- Keppner, L., 2019. Personal communication.
- Knudsen, Gary, D. and James W. Stoutmire, 1979. *Partial Cultural Resource Inventory of Tyndall Air Force Base*. Southeast Conservation Center. Florida State University, Tallahassee, Florida. Archaeological Research Reports 7. Submitted to National Park Service, Southeast Regional Archaeological Services Branch, Atlanta, Georgia.
- Longieliere, T. J., G. O. Bailey, and H. L. Edmiston, 1997. Rare Nesting Occurrence Of The Leatherback Sea Turtle, *Dermochelys Coriacea*, In Northwest Florida. Poster paper presented at the 1997 annual symposium on sea turtle conservation and biology. March 4-8, 1997. Orlando, Florida.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- National Marine Fisheries Service and U.S. Fish and Wildlife Service (USFWS), 1991. Recovery Plan for U.S. Population of Loggerhead Turtle (*Caretta caretta*).
- Northwest Florida Water Management District (NFWFMD), 2017. St. Andrew Bay Surface Water Improvement and Management Plan, Program Development Series 17-08.
- NFWFMD, 2018. 2015-2016 Land Use GIS Data. Published 02 February 2018.
- Peterson, C.L. and C.C. Campbell, 2007. Seed collection and research on eight rare plant species of the Florida Panhandle region. USFWS grant agreement 401815G173.
- Solutio Environmental, 2017. *Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide – Fundamental, Volume 1 of 2*. Solutio Environmental, Inc. August 2017.
- Tyndall AFB, 2015. 2015-2016 Tyndall AFB Hunting, Fishing and General Recreation Regulations. Approved 23 September 2015.
- Tyndall AFB, 2019a. Land Cover Geodatabase provided by Tyndall AFB August 2019.
- Tyndall AFB, 2019b. Fiscal Year 2020 Military Construction Project Data - Tyndall AFB, DoD Form 1391. April-August 2019.
- Tyndall AFB, 2019c. *Community Relations Plan, Tyndall Air Force Base, Florida*. April 2019.
- Tyndall AFB, 2020. Wetland Delineation Report for Hurricane Recovery and Installation Development at Tyndall AFB, Florida. February 2020.
- U.S. Army Corps of Engineers (USACE), 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*. ERDC/EL TR-10-20. November 2010.
- U.S. Air Force (Air Force), 1996. *Air Force Installation Force Protection Guide*. AFCEC. 1 January 1996.
- Air Force, 2003. *Air Force Instruction 32-7061 – The Environmental Impact Analysis Process*. U.S. Air Force – HQ AF/A7CI. March 2003.
- Air Force, 2013. *Guidance – Excavation and Construction on, or near, Environmental Cleanup Sites*. U.S. Air Force – AFCEC/CZR. 11 April 2013.
- Air Force, 2014a. Guide for Environmental Justice Analysis under the Environmental Impact Analysis Process (EIAP). November 2014.
- Air Force, 2014b. *Air Force Instruction 32-7064 – Integrated Natural Resources Management*. U.S. Air Force – HQ A4CF. November 2014.
- Air Force, 2014c. *Air Force Instruction 90-2002 – Air Force Interactions with Federally-Recognized Tribes*. U.S. Air Force – HQ SAF/IEE. November 2014.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Air Force, 2015a. *Installation Development Plan, Tyndall Air Force Base, Florida*. April 2015.
- Air Force, 2015b. *Air Force Instruction 32-7062 – Comprehensive Planning*. U.S. Air Force – HQ AF/A7CI. December 2015.
- Air Force, 2015c. *Air Force Instruction 32-7063 – Air Installation Compatible Use Zone Program*. U.S. Air Force – HQ ILEPB. December 2015.
- Air Force, 2016a. *U.S. Air Force Integrated Cultural Resources Management Plan for Tyndall Air Force Base*.
- Air Force, 2016b. *Final Tyndall Air Force Base Air Installations Compatible Use Zone (AICUZ) Study*. April 2016.
- Air Force, 2016c. *Spill Prevention, Control, and Countermeasure Plan, Tyndall Air Force Base, Florida*. 6 May 2016.
- Air Force, 2016d. *Air Force Manual 32-1084 – Facility Requirements*. U.S. Air Force – AF/A4CFC. February 2016.
- Air Force, 2016e. *Air Force Instruction 32-7065 – Cultural Resources Management*. U.S. Air Force – HQ USAF/A4CA. 6 October 2016.
- Air Force, 2017a. 2017 Economic Impact Analysis. Tyndall Air Force Base, Florida.
- Air Force, 2017b. *Air Force Instruction 91-202 - The U.S. Air Force Mishap Prevention Program*. U.S. Air Force – HQ AFSEC/SEG. 15 February 2017.
- Air Force, 2017c. *Air Force Manual 91-201 – Explosives Safety Standards*. U.S. Air Force – AFSC/SEW. 9 June 2017.
- Air Force, 2017d. *Air Force Handbook 32-7084 – AICUZ Program Manager’s Guide*. U.S. Air Force – AFCEC/CP. 2 November 2017.
- Air Force, 2018a. *325th Fighter Wing Asbestos Management and Operations Plan*.
- Air Force, 2018b. *Threatened and Endangered Species Component Plan, Tyndall Air Force Base, Florida*.
- Air Force, 2018c. *Air Force Manual 91-203 – Air Force Occupational Safety, Fire, and Health Standards*. U.S. Air Force – HQ AFSEC/SEG. 11 December 2018.
- Air Force, 2018d. *Air Force Policy Directive 32-70 – Environmental Considerations in Air Force Programs and Activities*. U.S. Air Force – SAF/IEE. 30 July 2018.
- Air Force, 2019a. Air Force Housing. Available at: <https://www.housing.af.mil/Home/Units/Tyndall/>. Accessed 14 October 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- Air Force, 2019b. Tyndall AFB Units Fact Sheets. Available at: <https://www.tyndall.af.mil/About/Fact-Sheets/>. Accessed on October 14, 2019.
- Air Force, 2019c. Air Force Installation Status. Updated 31 May 2019.
- Air Force, 2019d. Integrated Natural Resources Management Plan, Tyndall Air Force Base, Florida. June 2019.
- Air Force, 2019e. Air Force Policy Directive 91-2 – *Safety Programs*. U.S. Air Force – AF/SEI. 3 September 2019.
- Air Force, 2019f. *Air Force Instruction 34-101 – Air Force Morale, Welfare, and Recreation (MWR) Programs and Use Eligibility*. U.S. Air Force – AF/A1S. 16 April 2019.
- Air Force, 2019g. *Air Force Instruction 32-1015 – Integrated Installation Planning*. U.S. Air Force – AF/A4CP. 30 July 2019. Air Force, 2019h. *Infrastructure Investment Strategy*. U.S. Air Force. 29 January 2019.
- Air Force, 2019i. *U.S. Air Force Hazardous Waste Management Plan, 325th Fighter Wing*. 11 September 2019.
- Air Force, 2019j. *Air Force Instruction 32-1001 – Civil Engineer Operations*. U.S. Air Forces – HQ AF/A4CF. 4 October 2019.
- Air Force, 2019k. *U.S. Air Force Integrated Solid Waste Management Plan, Tyndall Air Force Base*. 15 October 2019.
- Air Force, 2020. *Air Force Manual 32-7002 – Environmental Compliance and Pollution Prevention*. U.S. Air Force – AF/A4CA. 4 February 2020.
- U.S. Census Bureau, 2000a. DP-1. Profile of General Demographic Characteristics: 2000. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2000b. P-12. Sex by Age: 2000. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2010a. DP-1. Profile of General Demographic Characteristics: 2010. 2010 Census Summary File 1. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2010b. P-12. Sex by Age: 2010. Census 2010 Summary File 1 (SF 1) 100-Percent Data. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017a. B02001. Race. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- U.S. Census Bureau, 2017b. B23025. Employment Status for the Population Over 16 years and Over. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017c. C24030. Sex by Industry for the Civilian Employed Population 16 Years and Over. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017d. C24050. Industry by Occupation for the Civilian Employed Population 16 years and Over. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017e. DP03. ACS Economic Characteristics Estimates. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017f. B19301. Per Capita Income in Past 12 Months (in 2017 Inflation-Adjusted Dollars). 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017g. CP04. ACS Comparative Housing Characteristics Estimates. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017h. B25004. ACS Vacancy Status Estimates. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017i. B25001. Housing Units. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017j. DP05. ACS Demographic and Housing Estimates. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017k. B19013. Median Household Income in the Past 12 Months (in 2017 Inflation- Adjusted Dollars). 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 14 October 2019.
- U.S. Census Bureau, 2017l. B01001. Sex by Age. 2013-2017 American Community Survey 5-Year Estimates. Available at: <https://factfinder.census.gov>. Accessed 30 December 2019.
- U.S. Code of Federal Regulations (CFR) Title 15 Part 930 – *Federal Consistency with Approved Coastal Management Programs*
- U.S. CFR. Title 29, Part 1910 et. seq. – *Occupational Safety and Health Standards*

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

U.S. CFR. Title 29, Part 1926 – *Safety and Health Regulations for Construction*

U.S. CFR. Title 32, Part 989 et seq – *Environmental Impact Analysis Process (EIAP)*

U.S. CFR. Title 33, Parts 320-330 – *Discharges of Dredge and Fill Materials into Waters of the U.S.*

U.S. CFR. Title 33, Part 332 – *Compensatory Mitigation for Losses of Aquatic Resources*

U.S. CFR. Title 36, Part 800 – *Protection of Historic and Cultural Properties*

U.S. CFR. Title 40, Part 93, Subpart B – *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*

U.S. CFR. Title 40, Part 261 – *Identification and Listing of Hazardous Waste*

U.S. CFR. Title 40, Part 273 – *Standards for Universal Wastes*

U.S. CFR. Title 40, Part 355 – *Emergency Planning and Notification*

U.S. CFR. Title 40 Parts 1500-1508 – *Council on Environmental Quality*

U.S. CFR. Title 44 Part 9 – *Floodplain Management and Protection of Wetlands*

U.S. Department of Agriculture (USDA), Soil Conservation Service, 1984. Soil Survey of Bay County, Florida.

USDA, Natural Resources Conservation Service (NRCS), 2019. Web Soil Survey. Internet URL: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

U.S. Department of Defense (DoD), 2009. *Department of Defense Instruction 1015.10 – Military Morale, Welfare, and Recreation (MWR) Programs*. 6 July 2009.

U.S. DoD, 2012a. Department of Defense Manual 6055.09-M – *DoD Ammunition and Explosives Safety Standards*. 12 March 2012.

U.S. DoD, 2012b. *Unified Facilities Criteria 4-010-01 – DoD Minimum Antiterrorism Standards for Buildings*. February 2012.

U.S. DoD, 2012c. *Unified Facilities Criteria 2-100-01 – Installation Master Planning*. 15 May 2012.

U.S. Department of Labor, 2019. Florida Economy, U.S. Bureau of Labor Statistics. Available at: https://www.bls.gov/eag/eag.fl.htm#eag_fl.f.1. Accessed 14 October 2019.

U.S. DoD, 2016a. *Department of Defense Instruction 4710.02 – DoD Interactions with Federally-Recognized Tribes*. September 2016.

U.S. DoD, 2016b. *Unified Facilities 1-200-01 – DoD Building Code (General Building Requirements)*. 20 June 2016.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- U.S. DoD, 2018. *Department of Defense Instruction 4715.07 – Defense Environmental Restoration Program (DERP)*. 31 August 2018.
- U.S. Department of Transportation (USDOT), 2006. Federal Highway Administration Roadway Construction Noise Model User's Guide. USDOT, Research and Innovative Technology Administration. January 2006.
- U.S. Environmental Protection Agency (USEPA), 1981a. *Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise*. Office of Noise Abatement and Control. October 1979. Revised July 1981. Available online at <https://nonoise.org/epa/Roll7/roll7doc27.pdf>.
- USEPA, 1981b. *Noise and its Management*. January 1981. Available online at <https://nonoise.org/epa/Roll19/roll19doc49.pdf>.
- USEPA, 2009a. Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 6 202(a) of the Clean Air Act. Federal Register Docket ID 7 No. EPA-HQ-OAR-2009-0171. 5 December 2009.
- USEPA, 2009b. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007. April 2009.
- USEPA, 2016a. *Combined Remedial Investigation/Feasibility Study for SR179 Miniaturization Range (OU 24), Tyndall Air Force Base, Panama City, Florida*. 19 May 2016.
- USEPA, 2016b. Construction and Demolition Debris Generation in the United States, 2014. USEPA Office of Resource Conservation and Recovery. December 2016.
- USEPA, 2019a. NAAQS Table. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>. Accessed 11 October 2019.
- USEPA, 2019b. AirData Air Quality Monitors. <https://epa.maps.arcgis.com/apps/webappviewer/index.html>. Accessed 11 October 2019.
- USEPA, 2019c. Section 404 of the Clean Water Act: How Wetlands are Defined and Identified. Available online at <https://www.epa.gov/cwa-404/section-404-clean-wateract-how-wetlands-are-defined-and-identified>. Accessed 11 October 2019.
- USEPA, 2019d. Superfund Site. Tyndall AFB, Florida. Website last accessed October 2019: <https://www.epa.gov/superfund/search-superfund-sites-where-you-live>.
- U.S. Fish and Wildlife Service (USFWS), 1970a. Conservation of Endangered Species and Other Fish and Wildlife. Federal Register, Vol. 35, No. 106. 2 June 1970.
- USFWS, 1970b. List of Endangered Foreign Fish and Wildlife. Federal Register, Vol. 35, No. 233. 2 December 1970.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

- USFWS, 1978. Listing and Protecting Loggerhead Sea Turtles as Threatened Species and Populations of Green and Olive Ridley Sea Turtles as Threatened Species or Endangered Species. Federal Register, Vol. 43, No. 146. 28 July 1978.
- USFWS, 1987. Recovery plan for the Alabama beach mouse (*Peromyscus polionotus ammobates*), Perdido Key beach mouse (*P. p. trisyllepsis*), and Choctawhatchee beach mouse (*P. p. allophrys*). U.S. Fish and Wildlife Service, Atlanta, Georgia.
- USFWS, 1994. Recovery plan for four plants of the lower Apalachicola region, Florida: *Euphorbia telephoides*, (Telephus spurge), *Macbridea alba* (white birds-in-a-nest), *Pinguicula ionantha* (Godfrey's butterwort), and *Scutellaria floridana* (Florida skullcap). U.S. Fish and Wildlife Service, Atlanta, Georgia.
- USFWS, 2001. Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for Wintering Piping Plovers. Federal Register, Vol. 66 , No. 132. 10 July 2001.
- USFWS, 2003. Recovery Plan for the Great Lakes Piping Plover (*Charadrius melodus*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota.
- USFWS, 2006. 5-Year Review: Summary and Evaluation for the Choctawhatchee Beach Mouse. U.S. Fish and Wildlife Service, Atlanta, Georgia.
- USFWS, 2007. *Euphorbia telephoides* (telephus spurge) 5-year review: summary and evaluation. U.S. Fish and Wildlife Service southeast region. Panama City Field Office, Panama City, Florida.
- USFWS, 2010. Recovery Plan for the St. Andrew Beach Mouse (*Peromyscus polionotus peninsularis*). U.S. Fish and Wildlife Service, Atlanta, Georgia.
- USFWS, 2011. Endangered and Threatened Species; Determination of Nine Distinct Population Segments of Loggerhead Sea Turtles as Endangered or Threatened. Federal Register, Vol. 76, No. 184. 22 September 2011.
- USFWS, 2014. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot. Federal Register, Vol. 79, No. 238. 11 December 2014.
- USFWS, 2015. 50 Code of Federal Regulations (CFR) 17, Fish and Wildlife Service, from <http://www.fws.gov/endangered/>, updated February 2015.
- USFWS, 2019a. Biological Evaluation to Determine Impacts to Federally-Listed Species from Tyndall Air Force Base's Hurricane Reconstruction Program.
- USFWS, 2019b. National Wetlands Inventory. U.S. Fish and Wildlife Service Available online at <https://www.fws.gov/wetlands/index.html>.

**Final Environmental Assessment for
Hurricane Recovery and Installation Development at Tyndall Air Force Base, Florida**

United States Geologic Survey, 2019. Ground Water Atlas of the United States; Alabama, Florida, Georgia, South Carolina. HA 730-G. Internet link: https://pubs.usgs.gov/ha/ha730/ch_g/G-text2.html. Last accessed 10 October 2019.

Weston Solutions, Inc., 2015. *Project-Specific Uniform Federal Policy Quality Assurance Project Plan: Environmental Restoration Program Site SS026/SS020 Vehicle Maintenance Area, EPA Operable Unit 03*. Tyndall Air Force Base, Florida. March 2015.

Wood, 2019. Phase I Archaeological Survey – Survey Areas TY-162, TY-163, and TY-164, Tyndall Air Force Base, Bay County, Florida. Prepared by Wood Environment & Infrastructure Solutions, Inc. November 2019.

Wunderlin, R.P. and B.F. Hansen, 2011. Guide to the Vascular Plants of Florida. Third edition. University of Florida Press, Gainesville, Florida.

