FINAL

Environmental Impact Statement for F-35A Wing Beddown at Tyndall AFB and MQ-9 Wing Beddown at Tyndall AFB or Vandenberg AFB

Executive Summary

United States Air Force
Air Force Civil Engineer Center
Air Combat Command

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This Executive Summary of the *Final Environmental Impact Statement for F-35A Wing Beddown at Tyndall AFB and MQ-9 Wing Beddown at Tyndall AFB or Vandenberg AFB* (the "EIS") provides an overview of the in-depth analysis of the Proposed Actions that are presented in the full Final EIS.

A CD containing the Final EIS as well as this Executive Summary is provided inside the back cover of this Executive Summary. An electronic copy of the Final EIS is available at each of the public libraries listed below.

In addition, electronic copies of the Draft EIS and Final EIS are available online at www.F-35WingandMQ-9WingEIS.com.

Libraries Holding Copies of the Final EIS

Tyndall AFB Area	**Vandenberg AFB Area**
Bay County Public Library 898 W. 11th Street Panama City, FL 32401 Panama City Beach Public Library 12500 Hutchison Blvd. Panama City Beach, FL 32407	Lompoc Main Library 501 E. North Avenue Lompoc, CA 93436 Santa Maria Public Library 421 South McClelland Street Santa Maria, CA 93454

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EXECUTIVE SUMMARY
FOR THE FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE F-35A WING BEDDOWN AT TYNDALL AFB AND MQ-9 WING BEDDOWN AT TYNDALL AFB OR VANDENBERG AFB

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Acronyms and Abbreviations

53 WEG	53rd Weapons Evaluation Group
ACC	Air Combat Command
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AOC	Area of Concern
APE	area of potential effects
APZ	Accident Potential Zone
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
BAI	Backup Aircraft Inventory
BASH	bird/wildlife aircraft strike hazard
BMP	best management practice
BOS	Base Operating Support
CA-1	Cabrillo Highway
Caltrans	California Department of Transportation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
COA	Certificate of Authorization
COC	Community of Comparison
CPIP	Culture Process Improvement Program
dB	decibels
DNL	day-night average sound level
DoD	Department of Defense
DODI	DoD Instruction
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
FDEP	Florida Department of Environmental Protection
FTU	Formal Training Unit
HQ	Headquarters
IFR	instrument flight rules
INRMP	Integrated Natural Resources Management Plan
L_{dnmr}	onset rate-adjusted monthly day-night average sound level
L_{eq-8hr}	8-hour equivalent noise level
LID	Low Impact Development
LOS	level of service
MOA	Military Operations Area
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
PAA	Primary Aerospace Vehicles Authorized
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
ROD	Record of Decision
ROI	region of influence
RPA	Remotely Piloted Aircraft
SecAF	Secretary of the Air Force
SHPO	State Historic Preservation Officer
SO_x	sulfur oxides
SUA	Special Use Airspace
SWPPP	Stormwater Pollution Prevention Plan
U.S.C.	United States Code
UAS	unmanned aircraft systems
US-98	U.S. Highway 98
USAF	United States Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
V/C	volume-to-capacity
VOC	volatile organic compound

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EXECUTIVE SUMMARY

ES.1. PURPOSE OF AND NEED FOR THE PROPOSED ACTION

ES.1.1 INTRODUCTION

This Executive Summary is designed to provide an overview of the Proposed Action and alternatives and to direct the reader to the Environmental Impact Statement (EIS). This Executive Summary does not take the place of the EIS. Please review the EIS for project details and for more details on the environmental consequences that are identified in this summary.

Figure ES-1. F-35A Aircraft

The F-35A is optimized to be a multi-role fighter, with the ability to perform air-to-air; air-to-ground; and intelligence, surveillance and reconnaissance (ISR) missions

F-35A characteristics are:

- **Wingspan:** 35 feet (10.7 meters)
- **Length:** 51 feet (15.7 meters)
- **Height:** 14 feet (4.38 meters)
- **Maximum takeoff weight:** 70,000 pound class
- **Engine thrust:** 43,000 pounds
- **Maximum speed:** over Mach 1.6
- **Mission Duration:** approximately 2 hours
- **Ceiling:** Above 50,000 feet (15,240 meters).
- **Crew:** one

The EIS addresses two proposed independent basing, or beddown actions, for Air Combat Command (ACC) aircraft. The two beddowns are independent as they do not rely on each other nor does one action trigger the need for the other. The proposed beddowns are:

(1) The beddown of an F-35A Operational Wing at Tyndall Air Force Base (AFB), Florida

(2) The beddown of an MQ-9 Remotely Piloted Aircraft (RPA) Wing at either Tyndall AFB, Florida, or Vandenberg AFB, California

Figure ES-1 describes the F-35A aircraft, and Figure ES-2 describes the MQ-9 aircraft. Figure ES-3 shows the locations and briefly describes the bases and missions of Tyndall AFB, Florida, and Vandenberg AFB, California.

Tyndall AFB provides special values to ACC with extensive overwater warning areas, regional air-to-ground ranges, and airspace for combat proficiency training.

In October 2018, Hurricane Michael damaged or destroyed nearly all base facilities and required the relocation of several missions from Tyndall AFB. During reconstruction of the base, there is no fighter flying-mission. Proposing to beddown an F-35A Operational Wing at Tyndall AFB would permit ACC to utilize the airspace and ranges, as well as the restored base facilities, at the precise time such capabilities would be needed for newly constructed F-35A fighters.

Tyndall AFB and Vandenberg AFB were identified as alternative MQ-9 Wing beddown locations that could best achieve the mission of the MQ-9 Wing while meeting ACC objectives to care for Airmen and provide improvements in work environment and overall quality of life.

The MQ-9 Wing beddown environmental impact analysis process (EIAP) started in the summer of 2018, but was placed on hold after Hurricane Michael while the future of Tyndall AFB was assessed. With the overlap of analyses at Tyndall AFB for both the F-35A Wing and MQ-9 Wing beddowns, the U.S Air Force (USAF) determined that combining the F-35A and MQ-9 analyses furthers the purposes of the National Environmental Policy Act (NEPA) and was the proper thing to do per Title 40 of the Code of Federal Regulations (CFR) Section 1508.25(a)(2).

Figure ES-2. MQ-9 Aircraft

The MQ-9 Reaper is a remotely piloted aircraft designed to identify and track time-sensitive targets with persistence and precision and to destroy or disable those targets. The MQ-9 is similar in length and height to a Cessna 208 Caravan single-engine turboprop, The MQ-9 is thinner and has a longer wingspan than the Cessna.

MQ-9 characteristics are:

- **Wingspan:** 66 feet (20.1 meters)
- **Length:** 36 feet (11 meters)
- **Height:** 12.5 feet (3.8 meters)
- **Weight:** 4,900 pounds (2,223 kilograms) empty
- **Maximum takeoff weight:** 10,500 pounds (4,760 kilograms)
- **Mission Duration:** approximately 12 hours
- **Ceiling:** Up to 50,000 feet (15,240 meters)
- **Crew (remote):** two (pilot and sensor operator)

This EIS analyzes the potential environmental consequences to the human and natural environment that may result from the proposed beddown of the F-35A Operational Wing at Tyndall AFB; the proposed beddown of the MQ-9 Wing at either base; and the potential consequences that may result if Tyndall AFB were selected for both the F-35A Wing and the MQ-9 Wing beddowns. This EIS incorporates and evaluates the two independent beddown decisions to be sure that the potential environmental consequences, of either or both Wing decisions, are documented for decisionmakers. This EIS is prepared by the USAF in accordance with NEPA (42 United States Code [U.S.C.] 4321 et seq.) and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500–1508).

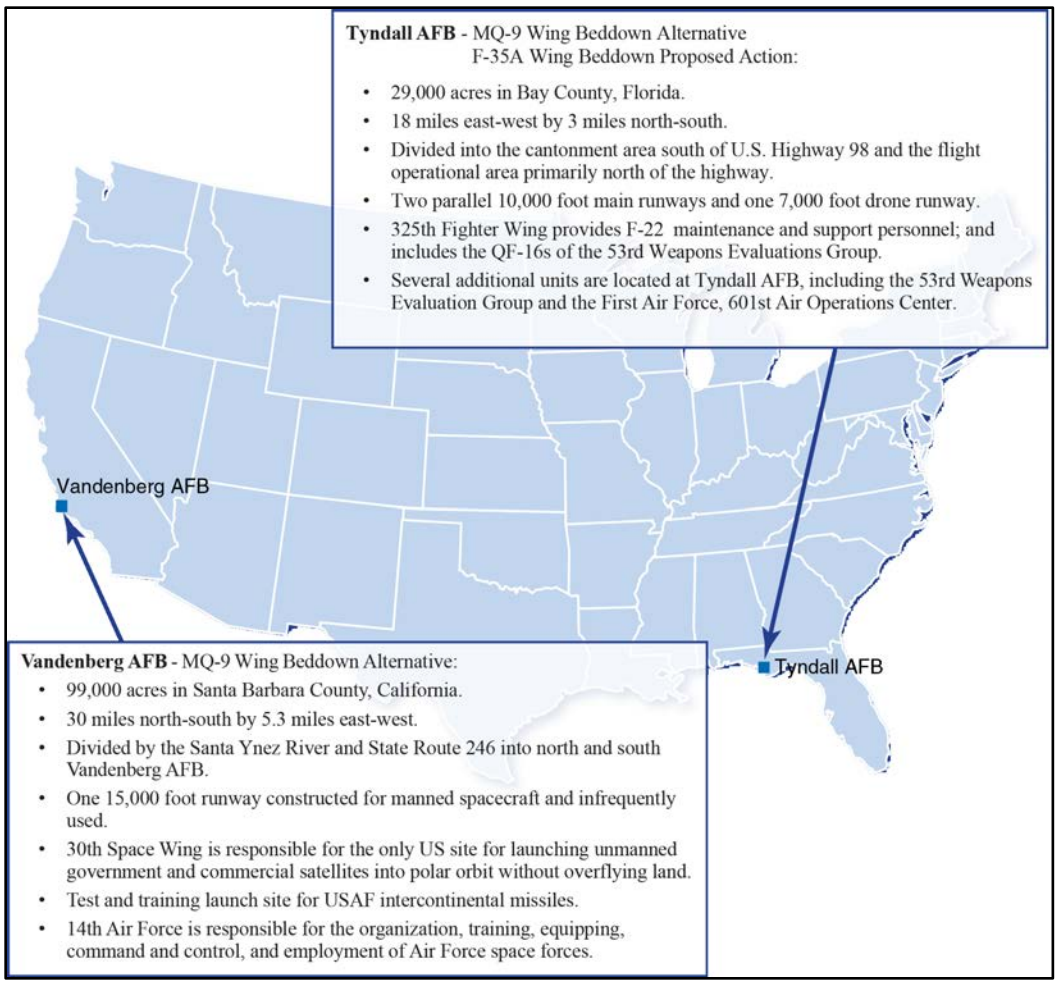

Figure ES-3. Tyndall AFB and Vandenberg AFB

Section ES.1.2, below, summarizes the purpose and need for the F-35A Operational Wing beddown, and Section ES.1.3 summarizes the purpose and need for the MQ-9 Operational Wing beddown.

ES.1.2 F-35A OPERATIONAL WING BEDDOWN

The USAF proposes to beddown F-35A operational aircraft at Tyndall AFB beginning as early as 2023. These aircraft would become part of the Combat Air Forces that defend the sovereign airspace of the United States, as well as deploy worldwide, meeting national defense requirements.

ES.1.2.1 Purpose of the F-35A Operational Wing Beddown

The purpose of the proposed F-35A action is to beddown an F-35A Operational Wing at Tyndall AFB. Hurricane Michael forced the USAF to move the Tyndall F-22A and supporting T-38 missions. The USAF was already considering restructuring the F-22A fleet to improve fleet health and efficiency and the hurricane provided the impetus and opportunity to carry out that restructuring, which would not include moving F-22As back to Tyndall. Tyndall AFB needs to be

retained as a fighter aircraft base due to its unique location with regard to premier training airspace. Base reconstruction will require several years to re-establish facilities and infrastructure to support a fighter aircraft mission, and the timing of reconstruction of the base directly corresponds with manufacture and delivery of the F-35A. These combined factors of extensive existing training airspace, modernized infrastructure, and scheduled aircraft delivery, led the USAF to determine that only Tyndall AFB would address the need for beddown of an additional active duty Continental U.S.-based F-35A Wing and backfill for aircraft realigned as a result of Hurricane Michael.

The proposed F-35A Operational Wing beddown at Tyndall AFB would provide combat capability and mission readiness for combat ready pilots as the USAF faces deployments across a spectrum of conflicts, while also providing for homeland defense.

ES.1.2.2 Need for the F-35A Operational Wing Beddown

The USAF recognizes a need to optimize its fifth-generation operational fighter fleets to ensure they have adequate training ranges, facilities, and airspace necessary to effectively produce qualified combat pilots. At the same time, the USAF must retain Tyndall AFB due to its unique location in proximity to premier airspace for fifth-generation fighter training. The combined timing of rebuilding Tyndall AFB, restructuring the F-22A fleet and the F-35A manufacturing and delivery schedule make Tyndall AFB the obvious, and only, choice for another Continental U.S. active duty F-35A Wing. Eventually, the USAF will need to operate and maintain more than 1,700 F-35A aircraft at locations that provide necessary facilities and have optimal access to modern ranges and sufficient airspace.

ES.1.3 MQ-9 RPA OPERATIONAL WING BEDDOWN

The USAF proposes to beddown the MQ-9 RPA Operational Wing with 24 MQ-9 aircraft at one of two alternative bases, Tyndall AFB or at Vandenberg AFB, over a period of approximately 3 years, beginning as early as 2023.

ES.1.3.1 Purpose of the MQ-9 Operational Wing Beddown

The purpose of the MQ-9 Wing beddown would be to achieve operational requirements while enhancing recruiting for, and developing and retaining of, high-quality RPA Airmen; enabling the development of successful RPA leaders; and eliminating obstacles to mission accomplishment. The beddown location would take care of our Airmen while ensuring MQ-9 operational personnel have the capability to accomplish primary functions associated with operating and maintaining an MQ-9 Wing.

ES.1.3.2 Need for the MQ-9 Operational Wing Beddown

ACC needs to address MQ-9 operational requirements by providing diversity of operations, not having all of the MQ-9 assets at one location, training in varied and advanced airspace and ranges, training over water, and increasing leadership opportunities. Current training, which occurs either

with simulators or in combat conditions, does not provide for comprehensive training of crews for system maintenance at forward locations or for diversified continuation training, which is severely lacking under current conditions. The need for the Proposed MQ-9 Wing beddown action was also identified in ACC's Culture Process Improvement Program (CPIP), which targeted and developed methods to address concerns identified by Airmen and family members in the RPA (including the MQ-9) career fields. The CPIP identified needed improvements in the work environment, retention, readiness, and overall quality of life to prevent the strategic collapse of the USAF RPA enterprise, and enhance and grow opportunities for Airmen and their families.

ES.1.4 PUBLIC AND AGENCY INVOLVEMENT

CEQ regulations for implementing the NEPA (40 CFR 1500–1508), and the USAF's implementing regulations (32 CFR 989), require the USAF to consider potential environmental consequences of its proposed action early and concurrent with the initial project planning stages. An EIS documents the detailed study of the potential environmental consequences of the proposed action, as well as cumulative impacts. When preparing an EIS, the USAF is required to invite review from other federal, state, and local agencies and from the public. When providing input on the EIS, the USAF requests that comments be substantive in nature. Generally, substantive comments are regarded as those specific comments that challenge the analysis, methodologies, or information in the EIS as being factually inaccurate or analytically inadequate; that identify impacts not analyzed or developed and evaluate reasonable alternatives or feasible mitigations not considered by the USAF; or that offer specific information that may have a bearing on the decision, such as differences in interpretations of significance, scientific, or technical conclusions, or cause changes or revisions in the proposal. All substantive comments, either written or verbal, received during the public comment period, will be given full and equal consideration in the preparation of the Final EIS.

ES.1.4.1 Stages of the Environmental Review Process

Notice of Intent (NOI). The USAF published an NOI to prepare the EIS in the Federal Register on November 25, 2019. Notices were also published in local newspapers near each of the two MQ-9 alternative bases. The NOI formally initiated the public scoping process. The NOI included descriptions of the alternatives and the scoping process and the dates, times, and locations of the scoping meetings. The NOI also invited affected federal, state, and local agencies; affected Indian tribe(s); and interested persons (e.g., the public) to participate in the scoping process.

Scoping. The USAF held two public scoping meetings near Tyndall AFB and Vandenberg AFB. The purpose of the public scoping meetings was to gather community-specific concerns to help focus the EIS analysis. The meetings were arranged in a "come and go," open-house format with no formal presentation or opportunity for public testimony. Meeting attendees were asked to sign in and written comments were accepted. Poster display stations were set up and staffed approximately one-half hour prior to each meeting's scheduled start time to answer questions concerning the EIS process, the Proposed Actions and alternatives, and base- and mission-specific questions. Resource specialists were on hand to provide information, answer questions, facilitate the identification of issues, and encourage public involvement. Throughout the scoping period, the

USAF actively solicited comments through press releases, newspaper ads, flyers, web posting, and similar communications channels.

Draft EIS Notice of Availability (NOA) and Notice of Public Hearing. On June 19, 2020, a formal notice was published in the Federal Register by the U.S. Environmental Protection Agency (USEPA) announcing that the Draft EIS is available at public libraries and on the project website for review by the public and federal, state, and local agencies. The NOA was also published in local newspapers.

Public Hearings on the Draft EIS. The NOA included the dates, times, and process for the public hearings associated with each of the two alternative bases. Based on multiple considerations related to the COVID-19 pandemic, the USAF made the decision to shift the format of the public hearings from in-person and in a physical meeting space to a "virtual" format. Virtual public hearings were held via webcast on July 14, 2020, for Tyndall AFB, and on July 15, 2020, for Vandenberg AFB.

Final EIS. The Final EIS documents the comments received on the Draft EIS and includes responses to all substantive comments. This version of the document could include modifying alternatives; supplementing, improving, or modifying the analyses; and correcting factual and typographical corrections.

Final EIS NOA. On December 4, 2020, a formal notice was published in the Federal Register by the USEPA and in local newspapers. These publications are followed by a 30-day waiting period.

Record of Decision (ROD). The USAF will prepare concise, public RODs that will address the USAF decisions on the two Proposed Actions, identify alternatives considered, specify the environmentally preferred alternatives, and state whether all practicable means to avoid or minimize environmental harm have been adopted (and if not, why they were not). A notice of the ROD availability will be announced in the Federal Register no sooner than the end of the Final EIS 30-day waiting period.

ES.1.4.2 Consultation and Coordination Requirements

Consultation/coordination may be required with various authorities during the conduct of the EIAP. See EIS Table 1.4-4 for consultation/coordination requirements and status.

Consultation with Federally Recognized Indian Tribes

In accordance with the National Historic Preservation Act (NHPA), Executive Order (EO) 13175, Department of Defense (DoD) Instruction (DODI) 4710.02, and Department of Air Force Instruction (AFI) 90-2002, the USAF conducts government-to-government consultation with federally recognized tribes on actions with the potential to significantly affect protected tribal resources, tribal treaty rights, or Indian lands.

The USAF initiated government-to-government consultation with federally recognized Indian Tribes (Tribes) that might have an interest in the Proposed Actions at Tyndall AFB and Vandenberg AFB by submitting letters to federally recognized tribes informing them of the

USAF's intent to prepare the EIS and inviting them to meet to discuss issues that have the potential to significantly affect protected tribal resources, tribal rights, or Indian Lands. The USAF followed up with the same Tribes prior to the release of the Draft EIS, inviting them to conduct government-to-government discussions to ensure that Tribes understand, and have the opportunity to participate in, review of USAF activities that could have the potential to affect tribal interests. The Seminole Tribe of Florida responded that they had no further comments, and requested notification if any archaeological, historical, or burial resources are inadvertently discovered. The Santa Ynez Band of Chumash Indians (in California) responded with concerns for potentially undiscovered cultural resources in the areas of construction near the Vandenberg AFB airfield. Government-to-government consultations with potentially affected Tribes for the F-35A Wing and MQ-9 Wing beddown Proposed Actions at Tyndall AFB and for the MQ-9 Wing beddown proposed action at Vandenberg AFB are complete. Consultation correspondence is included in Appendix A.

NHPA Consultation with State Historic Preservation Officers

In compliance with Section 106 of the NHPA, the USAF consulted with the Florida State Historic Preservation Officer (SHPO); the California Office of Historic Preservation, which acts as the SHPO; and interested parties regarding its determination of effects to historic properties for the proposed construction and flight operations activities at Tyndall AFB and Vandenberg AFB, respectively. In a letter dated July 29, 2020, the Florida SHPO concurred with the USAF determination that the proposed F-35A Wing and MQ-9 Wing beddown undertakings will have no effect to historic properties listed or eligible for listing in the National Register of Historic Places (NRHP). In a letter dated June 3, 2020, the California SHPO closed the consultation until and unless Vandenberg AFB is selected as the MQ-9 beddown location (see EIS Appendix A).

Section 7 Consultation with the U.S. Fish and Wildlife Service

In compliance with Section 7 of the Endangered Species Act, the USAF formally consulted with the U.S. Fish and Wildlife Service (USFWS) regarding impacts to federally listed threatened and endangered species. Biological Assessments were prepared and submitted to USFWS offices in California and Florida. In a letter dated August 3, 2020, consultation with the USFWS Panama City Field Office concluded with their concurrence with the USAF determination of *No Effect* and *not likely to adversely affect* threatened and endangered species at Tyndall AFB. On September 21, 2020, the USFWS Ventura office concurred with the USAF determination of *not likely to adversely affect* for the California least tern, western snowy plover, and southern sea otter and issued a Biological Opinion describing avoidance and minimization measures for the Lompoc yerba santa, California red-legged frog, and vernal pool fairy shrimp (see EIS Appendix A).

ES.1.4.3 Lead and Cooperating Agencies

A cooperating agency is defined by CEQ regulations as any federal, state, or local agency other than a lead agency having jurisdiction by law or special expertise with respect to any environmental issue involved in a proposal (40 CFR 1508.5). By execution of a Memorandum of Understanding with the USAF, Bay County is a cooperating agency for this EIS. The USAF is working with Bay County, Florida, and Bay County cities (through the County) to ensure compatible future community and Tyndall AFB future mission planning as the base, county, and

cities rebuild. Bay County reviewed a developmental version of the Draft EIS, and review comments were incorporated into the Draft EIS.

ES.2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

ES.2.1 INTRODUCTION

This section describes the Proposed Actions and the alternatives identified to fulfill the purpose of and need for an F-35A Operational Wing beddown at Tyndall AFB and an MQ-9 RPA Operational Wing beddown at either Tyndall AFB or Vandenberg AFB.

ES.2.2 F-35A OPERATIONAL WING BEDDOWN

The F-35A Proposed Action is to beddown an F-35A Operational Wing at Tyndall AFB and to train in existing airspace and ranges. The F-35A Proposed Action includes construction and/or modification of facilities on the base to support the F-35A operational aircraft, assignment of personnel needed to operate and maintain the F-35A, and F-35A training flights at the airfield, in existing airspace, and at training ranges accessible to Tyndall AFB. No new airspace would be established as part of the F-35A Proposed Action.

Two broad sets of requirements were applied to the proposal to beddown the F-35A Wing at Tyndall AFB. Military judgment and mission requirements led to the identification of Tyndall AFB as the location for an F-35A Operational Wing. These requirements are as follows:

- Achieve military judgment plans and guidance, including global posture, building partnerships, total force, beddown timing in relation to available aircraft, force structure logistics supportability, resources, and budgeting.
- Achieve mission requirements, including extensive existing airspace and range capabilities to allow the full exercising of F-35A system capabilities, and base capacity for an operationally efficient F-35A Wing.

Military judgment and mission requirements include the need to ensure F-35A combat-ready active-duty aircrews and maintainers are prepared to meet USAF worldwide deployments.

ES.2.2.1 F-35A Wing Beddown Alternatives

Review of the military judgment and mission requirements resulted in the identification of two alternative F-35A Wing squadron configurations for Tyndall AFB:

(1) Three-Squadron F-35A Wing Alternative: Beddown three F-35A Operational Squadrons, each with 24 Primary Aerospace Vehicles Authorized (PAA) and 2 Backup Aircraft Inventory (BAI) aircraft, which would result in a total of 72 PAA and 6 BAI at Tyndall AFB. Aircraft operations and maintenance would be located in the "fighter campus" area of the flight line district. A mixture of repaired and reconstructed existing facilities and new construction would support the F-35A Wing. F-35A-specific facilities

would be required on the flight line. Airfield and airspace operations would occur in existing airspace. A three-squadron F-35A Wing was considered in terms of mission, capacity, environmental planning, reasonable cost, and management factors. The F-35A Wing with three squadrons met or exceeded all factors, which identified Tyndall AFB as an excellent Wing location.

(2) Four-Squadron F-35A Wing Alternative: The hurricane provided the opportunity to reconstruct Tyndall AFB with the capacity for future growth by accommodating a fourth squadron of F-35A aircraft. The Four-Squadron Wing Alternative is an expansion alternative that adds a fourth squadron of 24 PAA and 2 BAI to the F-35A Wing, resulting in a total of 96 PAA and 8 BAI F-35A aircraft. Flight line facilities to support the four-squadron alternative aircraft operations and maintenance could be consolidated in the same facilities built for a three-squadron alternative, and could require additional facilities within the same construction footprint identified within Figure ES-4. Airfield operations, personnel, airspace, and range use by a fourth squadron would be proportionate to one of the three squadrons. The four-squadron Wing was compared to factors that led to Tyndall AFB being identified for beddown of an F-35A Wing. A four-squadron F-35A Wing was considered in terms of mission, capacity, environmental planning, reasonable cost, and management factors. The F-35A Wing with four squadrons met or exceeded all factors, which identified Tyndall as an excellent Wing location. As noted above, the analysis of this fourth squadron is intended to cover the basing of an additional squadron of F-35A. If the USAF proposes to beddown another fifth-generation aircraft type or other aircraft in lieu of the fourth F-35 squadron, this EIS could serve, in part, as the basis for NEPA compliance and decision-making.

ES.2.2.2 Description of the Three-Squadron F-35A Wing Alternative at Tyndall AFB

The Three-Squadron F-35A Wing Alternative includes construction and/or modification of facilities on the base, basing of personnel needed to operate and maintain the F-35A, and F-35A training flights at the airfield and in existing airspace associated with Tyndall AFB. No new airspace would be established.

Facilities and Infrastructure for the F-35A Wing

Hurricane Michael damaged almost every facility on Tyndall AFB and destroyed many of the facilities. The flight line area was particularly affected. In order to beddown any fighter mission at Tyndall AFB, a number of facilities need to be rebuilt, and some fighter facilities that were damaged or destroyed need replacement.

As a result of anticipated climate change, all structural designs for base reconstruction and for any facilities associated with a new mission would be in alignment with the Secretary of the Air Force (SecAF)-directed Severe Weather Readiness Assessment instruction in the Air Force Civil Engineer Center's (AFCEC) *Severe Weather/Climate Hazard Screening and Risk Assessment Playbook* (AFCEC, 2020). The steps outlined in the Severe Weather Playbook were applied to reconstructed Tyndall facilities. Design and construction of facilities at the base will use a continuous wind load transfer from roof framing to foundation and construct with exterior envelope materials to reflect the anticipated severe weather hazards and risks. The USAF Unified Facilities Criteria for all facility designs will be combined with the best practices from the Florida

Building Code High-Velocity Hurricane Zone into the USAF design guidance. Application of this new guidance will further improve Tyndall AFB facility resiliency to be more capable of withstanding future Category 5 hurricanes ranging from 165 to 186 miles per hour (USAF, 2019b). The potential weather conditions used for the design of facilities are also being incorporated for the management of natural resources in the updated Tyndall AFB Integrated Natural Resources Management Plan (INRMP) (see EIS Section 3.1.4.1.4).

Repaired or rebuilt facilities for Tyndall AFB's recovery, not associated directly with a specific mission, include fuel storage and distribution, fire station, Civil Engineer Squadron facility, facilities to support personnel, and multiple other facilities. Optional locations for the facilities and infrastructure on Tyndall AFB were considered in the hurricane recovery base reconstruction planning and environmental process (USAF, 2020a). The Tyndall Installation Master Plan was updated by the Recovery Plan in conjunction with the base repair and rebuild following Hurricane Michael.

The proposed F-35A Wing requires specific facilities and infrastructure, including an Operations Group, a Maintenance Group, and a Wing Headquarters (HQ). EIS Table 2.2-1 presents F-35A-specific facility projects that are analyzed in the EIS for the three-squadron F-35A beddown alternative at Tyndall AFB. The buildings and facilities are undergoing detailed design in 2019–2020. The expected locations for the facilities have been identified, and the environmental analysis in this EIS is based on areas, or boxes, which would encompass the actual footprint of the building or facility and the construction area that could be disturbed during construction (see Figure ES-4).

Personnel and Dependents

The beddown of a three-squadron F-35A Wing at Tyndall AFB would require sufficient and appropriately skilled personnel to operate and maintain the aircraft and provide necessary support services. The beddown of a new F-35 Wing would bring an estimated 2,200 personnel to Tyndall AFB consisting of 2,100 active-duty USAF personnel (169 officers and 1931 enlisted), 13 DoD civilians, and an estimated 87 Base Operating Support (BOS) personnel.

A portion of the assigned USAF personnel would be accompanied by dependents. The 2,200 total Wing personnel were calculated to have 2,992 dependents, including 1,496 children, of whom approximately 1,100 would be school-aged.

Airfield Operations and Airspace and Range Use

F-35A aircrews would train to ensure combat readiness by conducting flight operations in three types of areas—the Tyndall AFB airfield, accessible airspace, and training ranges usable by the F-35A Operational Wing. The training airspace and ranges are geographically separate from the airfield.

The EIS uses two terms to describe different components of flying activities: sortie and operation. The different meaning of the two terms apply to specific activities of particular airspace environment or unit and provide a means to quantify activities for the purposes of analysis. A sortie consists of a single aircraft from take-off through a landing and includes a flying mission. The number of sorties summarizes the amount of flight activity from a base and can include more than a single operation. Each operation comprises one action, such as a take-off or a landing.

Closed pattern operations, such as a "touch and go" (practice approach followed by immediate take-off) constitute two airfield operations.

The number of airfield operations and sorties are estimated based on the Air Force Ready Aircrew Program training requirements. These requirements are designed to provide sufficient training for aircrew to be fully combat ready. The F-35A Wing would fly an average of 47 sorties per flying day, with each sortie lasting approximately 1.4 hours. Sorties would normally be conducted 5 days per week during 260 flying days per year. This flying schedule would occur normally during 12 hours on any given day.

This number of sorties means that a 72 PAA F-35A Wing would execute about 33,440 airfield operations per year. An estimated 1 percent of those operations could be during the hours of 10:00 p.m. to 7:00 a.m., defined as "environmental night". Environmental night receives special consideration for noise analysis because aircraft noise in those hours is seen as more intrusive than at other times. Activities (primarily sleeping) are more sensitive to noise at night, and the masking effect of ambient noise is reduced. The day-night average sound level (DNL) metric adds 10 decibels (dB) to the noise occurring during environmental night due to its increased impact.

Certain F-35A operational requirements, such as the use of afterburner, are mission- and situation-dependent, with safety being the primary requirement for an afterburner take-off. Runway length, temperature, atmospheric pressure, wind conditions, and aircraft loads (e.g., avionics, fuel, weapons) are some of the factors that influence pilot decisions to use afterburner power for departures versus standard military power. The EIS analysis includes three different scenarios for afterburner use: Scenario A is afterburner use on 5 percent of total take-offs, Scenario B is afterburner use on 50 percent of total take-offs, and Scenario C is afterburner use on 95 percent of total take-offs.

Figure ES-5 identifies the regional airspaces near Tyndall AFB. Mission training would occur in Special Use Airspace (SUA), including Warning Areas, Military Operations Areas (MOAs), and Airspace for Special Use Air Traffic Control Assigned Airspaces (ATCAAs). The MOAs provide airspace for military aircraft training and serve to warn non-participating aircraft of potential danger. Restricted Areas over ranges and overwater Warning Areas preclude entry by non-participating instrument flight rules (IFR) aircraft when the airspace is active for military training.

During proficiency training, F-35A pilots would employ supersonic flight at altitudes and within airspace already approved and charted by the Federal Aviation Administration (FAA) for such activities. The F-35A has an air-to-ground mission. Most air-to-ground ordnance delivery and air-to-air training would be simulated where nothing is released from the aircraft and electronic scoring is used. An estimated 100 annual sorties would involve deploying 200 inert munitions on existing ranges approved for the inert munitions.

Three squadrons of F-35A aircraft would deploy an estimated 31,630 MJU-61A/B training flares per year in airspace already approved for such use. Existing restrictions define the minimum altitude of flare use in the approved airspaces. Currently, there is no chaff approved for use by the F-35A. The F-35 Joint Program Office is developing RR-199 chaff cartridges for F-35A training use that may enter the inventory in 2021. The RR-199 training chaff would be wrapped in nontoxic treated paper. If the RR-199 chaff cartridges become part of the F-35A inventory at Tyndall AFB, an environmental analysis of the proposed use may be necessary at that time.

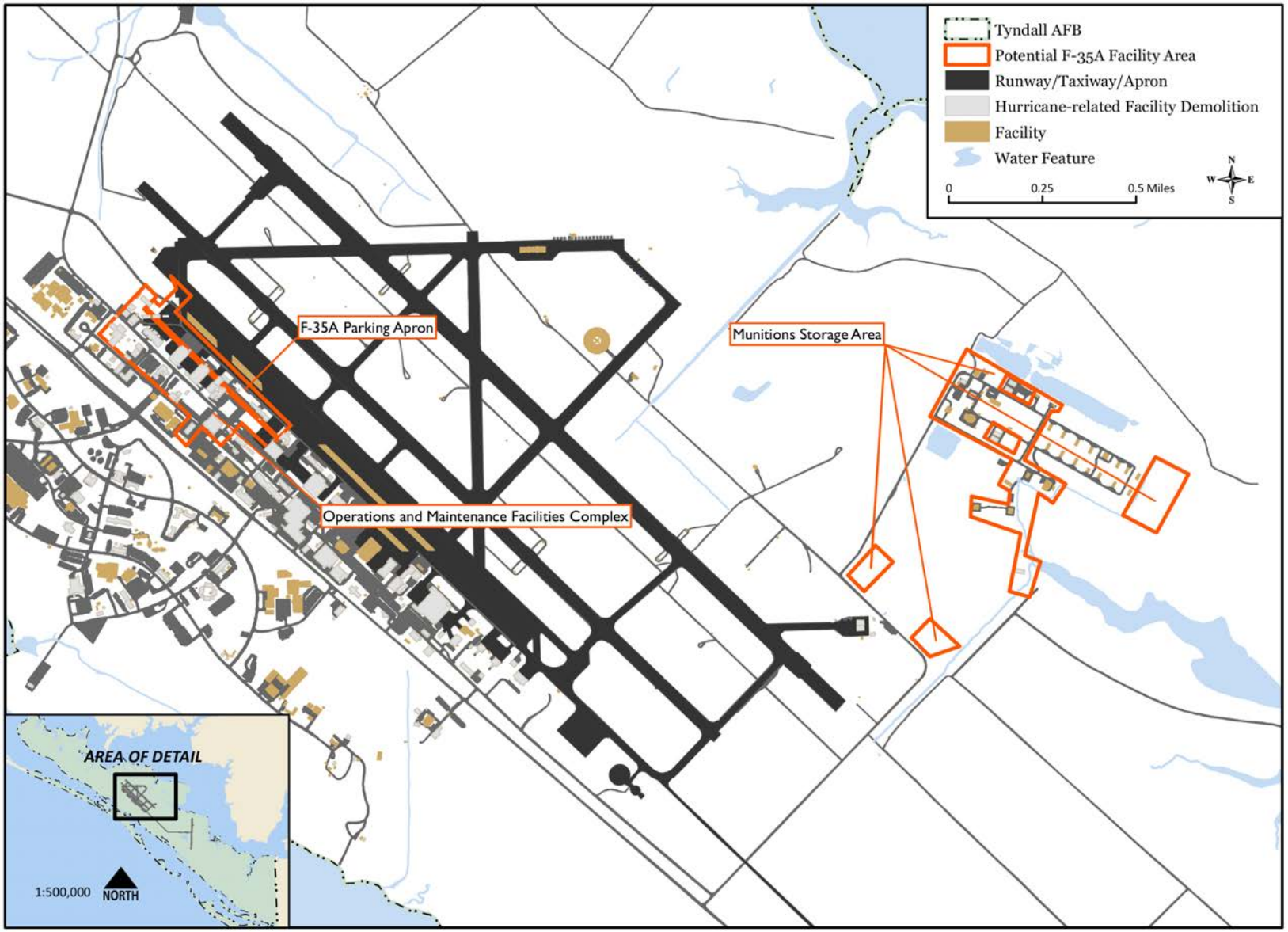

Figure ES-4. Tyndall AFB Facilities Locations Associated With the Proposed F-35A Beddown

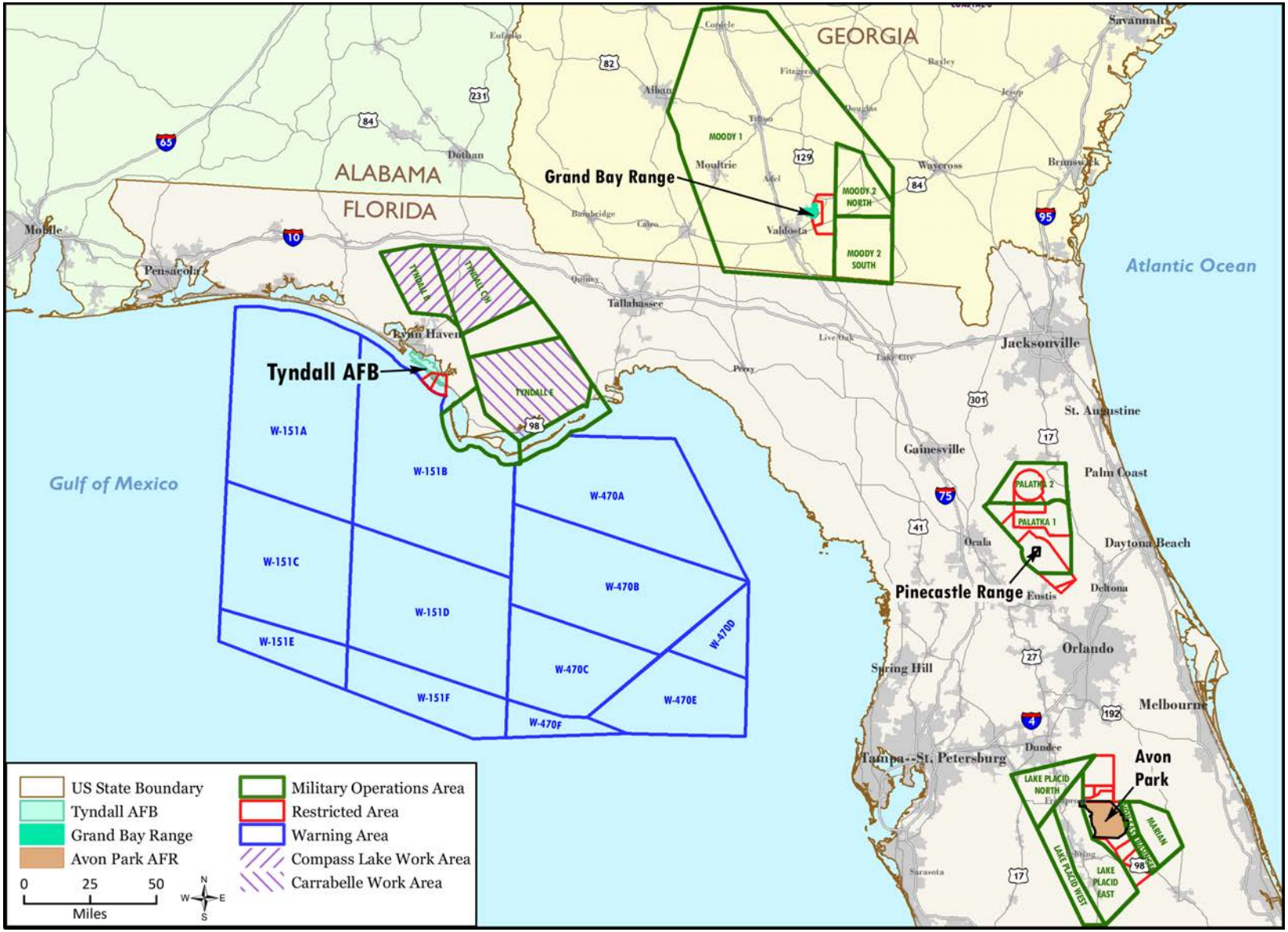

Figure ES-5. Regional Airspace and Ranges Proposed for F-35A Use

ES.2.2.3 Description of a Four-Squadron F-35A Wing Alternative at Tyndall AFB

The Four-Squadron F-35A Wing Alternative would beddown four F-35A active-duty squadrons with a total of 96 PAA and 8 BAI aircraft.

Facilities and Infrastructure. Flight line and other facilities needed to support the Four-Squadron F-35A Wing Alternative aircraft operations and maintenance could include the same facilities built for a three-squadron alternative but could require additional facilities and infrastructure within the same construction footprint identified in Figure ES-4.

Personnel and Dependents. A four-squadron F-35A Wing is estimated to bring 2,932 personnel to Tyndall AFB. The F-35A personnel for a four-squadron Wing could begin to arrive at Tyndall AFB in spring of 2022 and continue through to 2027. The 2,932 personnel would have approximately 3,988 dependents, including 1,994 children, of whom approximately 1,466 would be expected to be school-aged.

Airfield Operations and Airspace Use. The airfield, airspace, and ranges used for flight training with the four-squadron alternative would be the same as described for the three-squadron alternative. The four F-35A squadrons would be projected to fly 16,400 annual sorties, which would result in 44,586 annual airfield operations. Supersonic training would occur at altitudes and in airspace already approved for such flights. Ordnance use would occur on the same ranges identified in Figure ES-5. The annual number of sorties training with inert munitions is estimated to be 134. An estimated 268 inert munitions and 42,174 flares would be deployed by the four squadrons on the ranges and in the approved airspaces. Chaff would be as described for the three-squadron Wing.

ES.2.2.4 No Action Alternative for the F-35A Wing

40 CFR 1502.14(d) of the CEQ's regulations for implementing NEPA requires the analysis of a No Action Alternative in an EIS to provide a benchmark and enable decisionmakers to compare the magnitude of the environmental effects to a proposed action and alternatives. No action means that an action would not take place and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. Title 40 CFR 1502.14(d) of the CEQ's regulations for implementing NEPA requires the analysis of a No Action Alternative in an EIS to provide a benchmark, and enable decisionmakers to compare the magnitude of the environmental effects to a proposed action and alternatives. No action means that an action would not take place and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. No facilities construction, personnel changes, or airspace transit and proficiency training would occur at this time.

No action for the F-35A Wing proposal in this EIS reflects the status quo, where no beddown of an F-35A Wing would occur, and there would be no F-35A–related changes to base facilities, personnel, or airfield and airspace flight operations. The No Action Alternative would represent the affected environment for each environmental resource area in EIS Section 3.1. For the majority of the resource areas, the affected environment represents the most current data available. For a few resources, such as infrastructure and socioeconomics, the affected environment (No Action)

would represent the existing base conditions projected for 2023, when reconstruction of Tyndall AFB would be well underway, but without F-35A construction, personnel, or flight operations associated with a fifth-generation aircraft flying mission. There would continue to be transient aircraft and training aircraft using the available airspace, as well as working with the 53rd Weapons Evaluation Group (53 WEG). There would be manned and unmanned QF-16 flight operations in support of the 53 WEG. The total number of No Action base personnel and associated employees as of 2023 would be approximately 4,250 as compared with the pre-hurricane number of 5,657 (USAF, 2018a). An estimated 1,400 personnel were reassigned from Tyndall AFB with the F-22 and T-38 flight operations.

On March 26, 2019, the USAF published its NOI to prepare an EIS for the permanent bed down and operations of the F-22 Formal Training Unit (FTU) as required by the emergency alternative arrangements approved by CEQ. That EIS will assess the potential environmental consequences of the proposed action to permanently beddown the F-22 FTU at Langley AFB, Virginia, and the No Action Alternative, which consists of continuing F-22 FTU operations from a combination of Eglin AFB and Tyndall AFB in Florida. Due to the possibility that the USAF could select the No Action Alternative for the F-22 FTU permanent beddown, its continuing and recurring operations at Tyndall AFB is part of the No Action Alternative. Current F-22 FTU operations include some training and aircraft maintenance occurring at Tyndall AFB, utilizing the flight simulators and the low observable coatings maintenance facilities that survived the hurricane. In the past year, Tyndall AFB has slowly been recovering and regaining operational capability, which has permitted some flight training by the F-22 FTU to occur in Tyndall AFB airspace. While it is not the intent of the USAF to retain the F-22 FTU at Eglin AFB permanently, it may be necessary to continue F-22 FTU operations from a combination of Eglin AFB and Tyndall AFB until the USAF can fully analyze impacts for the preferred permanent location for the F-22 FTU, Langley AFB, Virginia, in order to maintain pilot production.

ES.2.2.5 Identification of Preferred Alternative for the F-35A Wing Beddown at Tyndall AFB

According to CEQ guidelines, an agency's preferred alternative is the alternative that the agency believes would fulfill its statutory mission and responsibilities, considering economic, environmental, technical, and other factors (CEQ, 1981). CEQ regulations require the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement…" (CEQ, 1981).

In spring 2019, the SecAF determined that Tyndall AFB is a preferred location for the beddown of a new F-35 Wing. The USAF has identified the Three-Squadron F-35A Wing Alternative as the preferred alternative for the F-35A Wing beddown at Tyndall AFB.

The USAF decisionmaker will use the information and analysis contained in this EIS, along with other factors, to decide how best to satisfy the stated purpose and need within mission constraints. A final determination regarding the beddown of the F-35A Wing at Tyndall AFB will be reflected in the ROD at the conclusion of the EIS process.

ES.2.3 MQ-9 RPA OPERATIONAL WING BEDDOWN

An MQ-9 Wing beddown at either Tyndall AFB or Vandenberg AFB would support ACC in the operation of MQ-9 RPAs with fully trained combat aircrews. The Wing's mission is twofold:

- Wing personnel conducting proficiency training in operations and maintenance of the MQ-9 aircraft at the selected base to ensure combat crews are fully capable of performing all mission tasks.
- Wing pilots and sensor operators would use cockpits at the selected base location to fly, by satellite, remote combat missions with MQ-9 aircraft based in an overseas theater of operations.

ES.2.3.1 Requirements for an MQ-9 Operational Wing at Either Base Location

Facilities and Infrastructure. The proposed MQ-9 Wing beddown would involve a combination of new construction and renovation to existing facilities and infrastructure. The Wing HQ would have an Operations Group and Maintenance Group at the selected base. The Wing would have two remote overseas squadrons and one assigned squadron of 24 MQ-9 aircraft stationed at the selected base. All beddown schedules incorporated in the EIS are subject to Congressional budget allocations.

Personnel and Dependents for the MQ-9 Wing Beddown. The beddown of the MQ-9 mission would require basing sufficient personnel to operate and maintain the aircraft and to provide necessary support services. The beddown of a new MQ-9 Wing would bring an estimated 1,900 additional personnel to the selected base. The additional personnel would include 1,500 active-duty USAF personnel (300 officers and 1,200 enlisted), 300 DoD civilians, and an estimated 100 BOS personnel who would provide engineering, contracting, and other base support for the new MQ-9 Wing. The 1,900 personnel would be accompanied by a calculated 2,584 dependents, including 1,292 children, of whom approximately 950 would be school-aged.

MQ-9 Aircraft Operations. MQ-9 Wing aircraft would operate from the selected airfield (Tyndall AFB or Vandenberg AFB) with clear line of sight to a Ground Data Terminal antenna for communications during take-off and landing. The remote pilot and sensor operator would take control of the flying aircraft using the primary MQ-9 satellite link for over the horizon communications. Aircraft operations include proficiency training for the MQ-9 aircrews and maintenance personnel that would permit operational pilots and sensor operators to support the wide range of the aircraft's capabilities. The 24 MQ-9 aircraft would normally conduct sorties 5 days per week during 260 flying days per year. The estimated 2,820 sorties would equate to about 5,640 airfield operations plus any additional closed pattern practice landings and takeoffs the operator may perform as part of a single sortie. A typical mission duration of 12 hours would result in as many as 2,200 of the 2,820 total annual sorties occurring, at least partially, during nighttime. An estimated 200 sorties would each involve deploying two inert munitions on existing ranges approved for the inert munitions. No live munitions would be deployed and the MQ-9 does not deploy defensive countermeasures such as chaff or flares.

ES.2.3.2 Detailed Description of the Tyndall AFB MQ-9 Wing Beddown Alternative

Facilities and Infrastructure. The base-specific facilities needed to beddown the MQ-9 Wing at Tyndall AFB are depicted on **Figure ES-**6 and identified in Table 2.3-1 in the EIS. Facilities would be constructed to meet severe weather conditions as described for the F-35A. Personnel and dependents would be as described in Section ES.2.3.1. MQ-9 aircraft operations at either base would be as described in Section ES.2.3.1.

Airfield, Airspace, and Ranges. **Figure ES-**6 identifies the optional locations for the Maintenance Complex. Depending on which Tyndall AFB siting option is chosen for the location of the Maintenance Complex, Tyndall AFB-based MQ-9 aircraft would normally conduct daily pattern work as depicted in Figure ES-7 within a 3-nautical mile radius of the Main Runway (Option 1) or the Alternate Runway (Option 2). The MQ-9 aircraft would operate in the training area presented in Figure ES-7 to the north, east, and south of the base using an FAA-approved Certificate of Authorization (COA) for 4 hours of daily pattern work during weekdays. With an approved COA, the MQ-9 training missions would use ATCAAs to the east or north of Tyndall AFB and would operate in the Eglin AFB-coordinated Gulf Regional Airspace Strategic Initiative Nail, Rustic, Raven North, and Raven South ATCAAs (see Figure ES-8).

An MQ-9 mission would use an approved FAA COA to transit to the Grand Bay Range managed by Moody AFB, Georgia, and to train in the adjacent MOAs/ATCAAs. Figure ES-8 presents the conceptual COA transit routes to access the training ranges from Tyndall AFB to transit to the south and east to the Avon Park Range, managed by MacDill AFB, Florida; and to train in the adjacent MOAs/ATCAAs. The COAs would all be 2 miles wide and are designed to avoid, to the extent possible, civil aviation flight operations. The overwater training range is located just south of Tyndall AFB in the offshore Restricted Areas (W-470 and W-151). Figure ES-8 also includes the Restricted Areas.

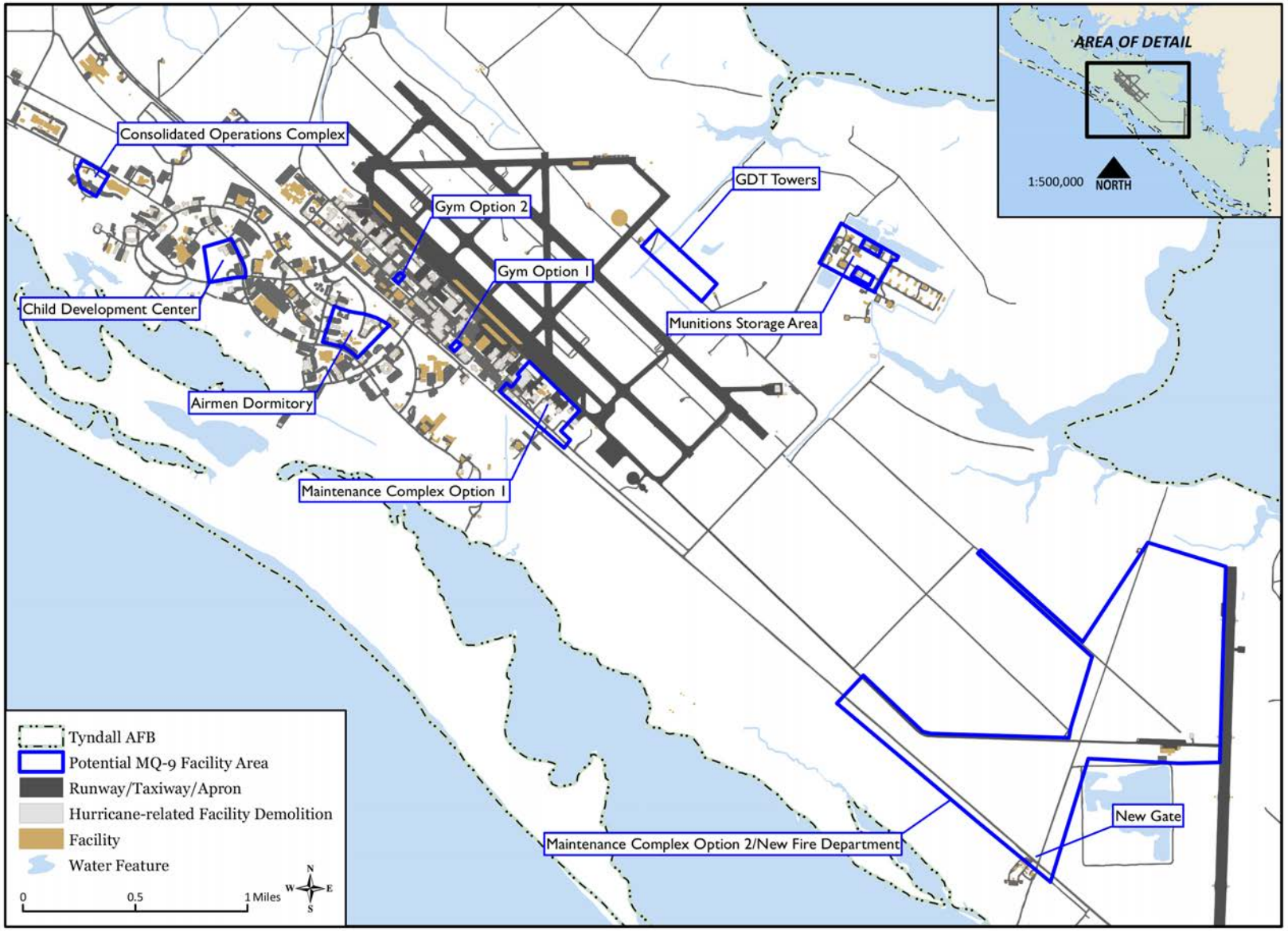

Figure ES-6. Tyndall AFB Facilities and Optional Facility Locations Associated With the Proposed MQ-9 Beddown

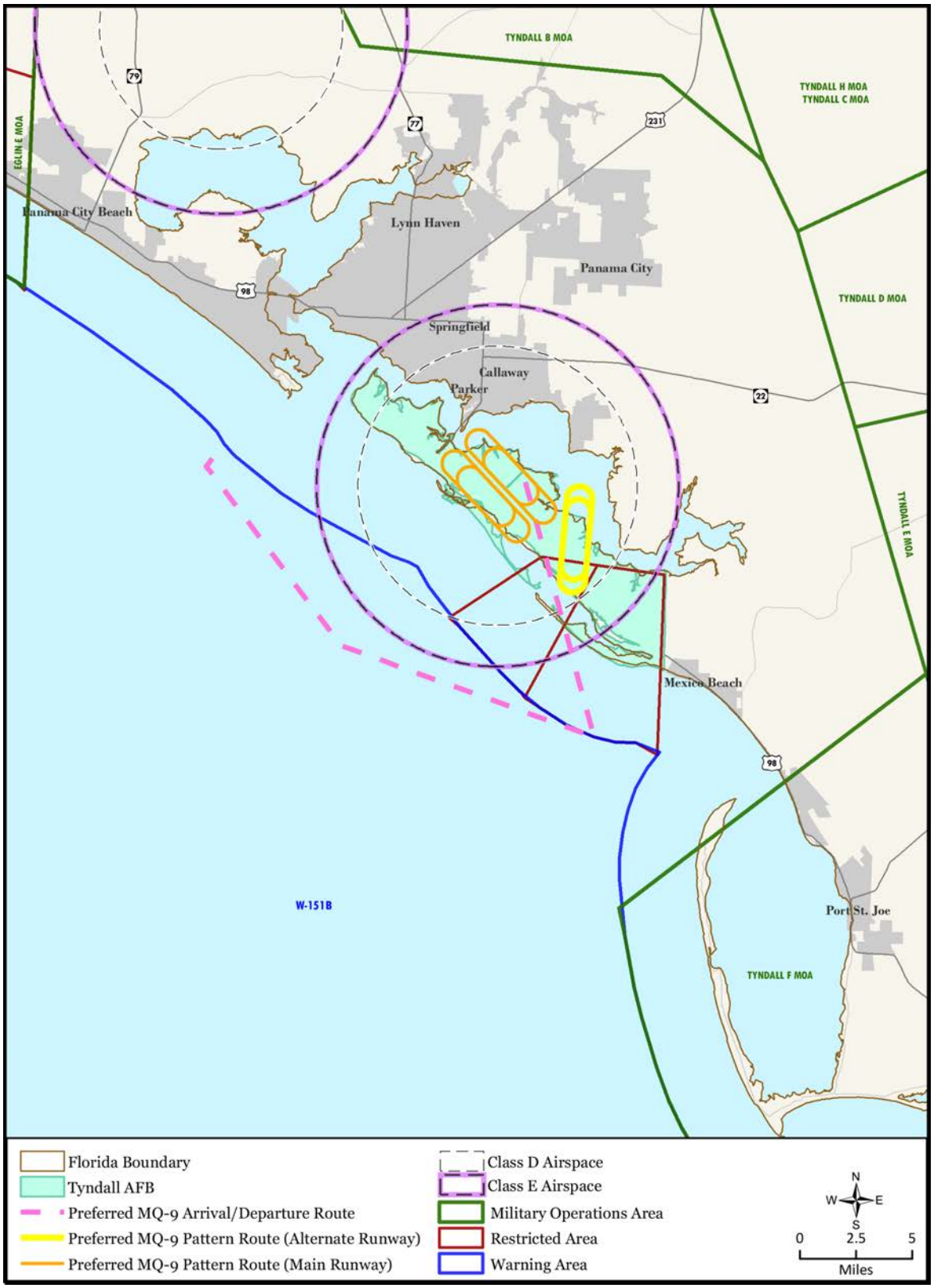

Figure ES-7. Proposed MQ-9 Patterns and Proposed MQ-9 Departure and Arrival Track in the Vicinity of Tyndall AFB

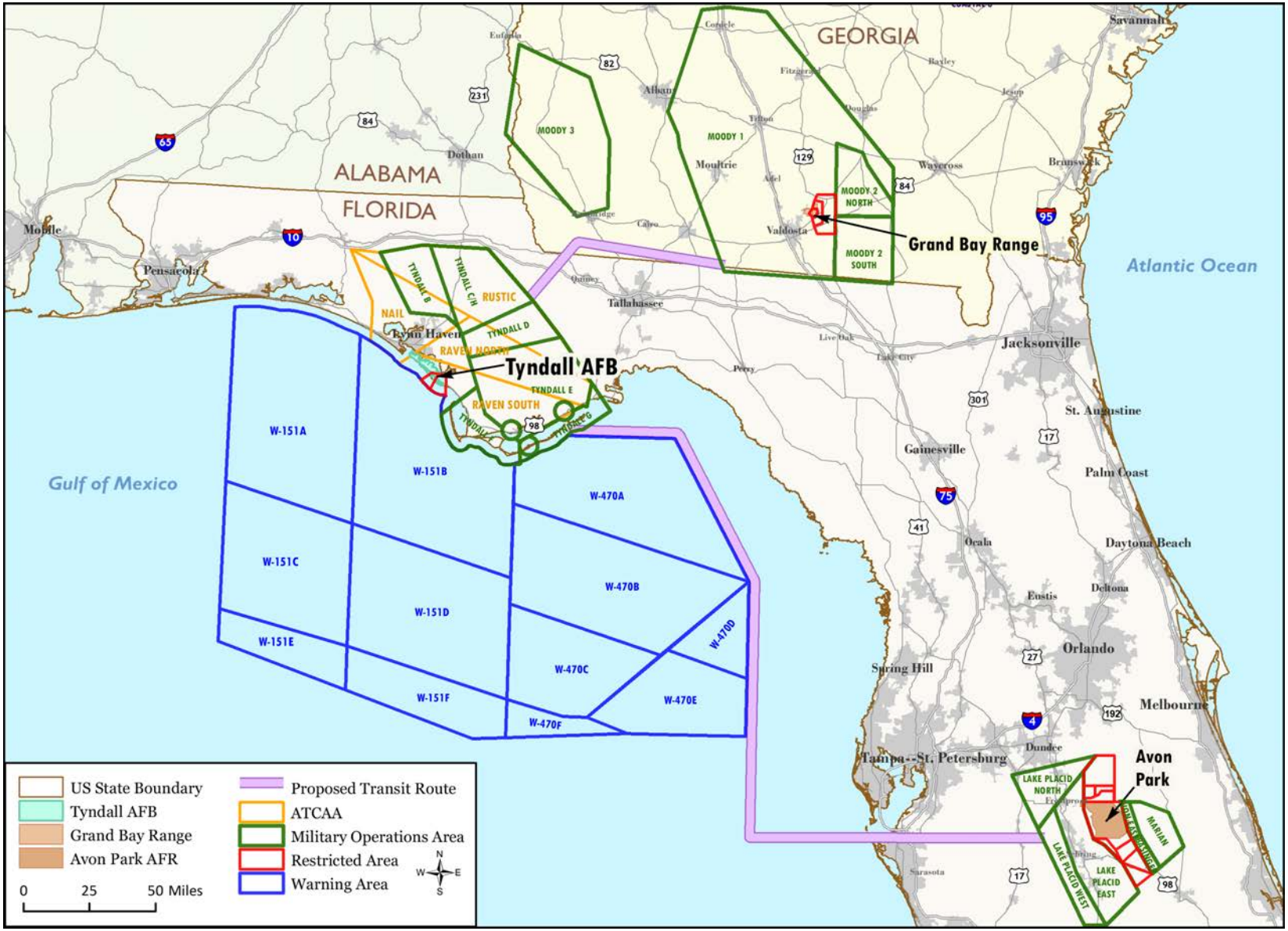

Figure ES-8. Proposed MQ-9 COA Transit Routes to Access Training Ranges from Tyndall AFB

ES.2.3.3 Detailed Description of the Vandenberg AFB MQ-9 Wing Beddown Alternative

Facilities and Infrastructure. The new facilities needed for the MQ-9 beddown at Vandenberg AFB include an Operations Complex and a maintenance Complex. Required facilities are depicted on Figure ES-9. No new munitions storage facility would be needed because Vandenberg AFB already has sufficient capacity to accommodate the inert munitions storage needs of the proposed MQ-9 Wing. Proposed MQ-9 facilities design would take into account the Preliminary Vandenberg AFB Installation-specific Climate Change Summaries for Incorporation into the Vandenberg AFB INRMP (AFCEC, 2020; Vandenberg AFB, 2020d).

Personnel. Personnel and dependents at Vandenberg AFB would be as described in Section ES.2.3.1 and EIS Section 2.3.1.2. MQ-9 Aircraft operations at either base airfield would be as described Section ES.2.3.1 and EIS Section 2.3.1.3.

Airfield, Airspace, and Ranges. Vandenberg AFB-based MQ-9 aircraft would normally conduct 4 hours of daily pattern work to the west and/or east of the base runway (Figure ES-10). Various factors would determine which pattern was flown, including meteorological conditions, sensitive marine and bird species, and altitude above on-base housing. The pattern work would be within Vandenberg AFB R-2516 restricted airspace or in W-537 restricted airspace and would not require an FAA-issued COA.

MQ-9 aircraft would operate in the approximately 40- by 10-nautical mile restricted airspace, R-2516, above Vandenberg AFB and/or in the warning areas immediately adjacent to Vandenberg AFB, to the west and south (see Figure ES-10). To allow for other aircraft or systems using Vandenberg AFB, R-2516 could be divided into R-2516A to the east and R-2516B to the west.

Figure ES-11 identifies ranges and conceptual transit COAs that would be associated with an MQ-9 mission at Vandenberg AFB. An MQ-9 mission to the Camp Roberts Army Base/Hunter Liggett Restricted Area to the north of Vandenberg could use an FAA-issued 2-nautical mile-wide COA. The MQ-9 could fly from R-2516 into the offshore-restricted warning areas (W-537) and transit from the offshore warning areas to train in the Hunter MOA.

An MQ-9 mission to the Navy San Clemente Range south of Vandenberg AFB would fly in W-537 and W-2895 restricted airspace to the R-2535 restricted airspace over the San Clemente Range (Figure ES-10). FAA COAs would not be required in restricted airspace.

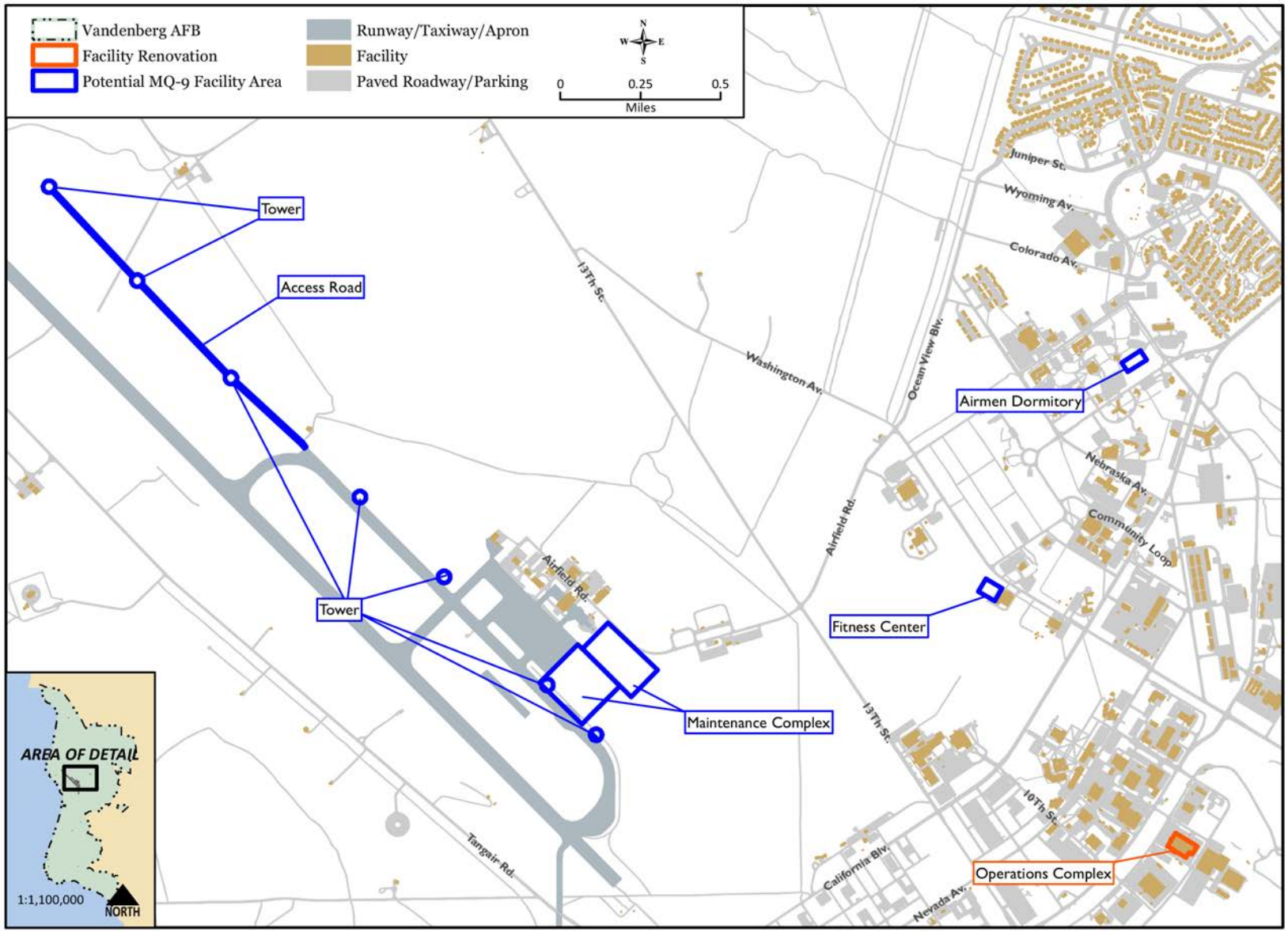

Figure ES-9. Vandenberg AFB Facilities Locations Associated With the Proposed MQ-9 Beddown

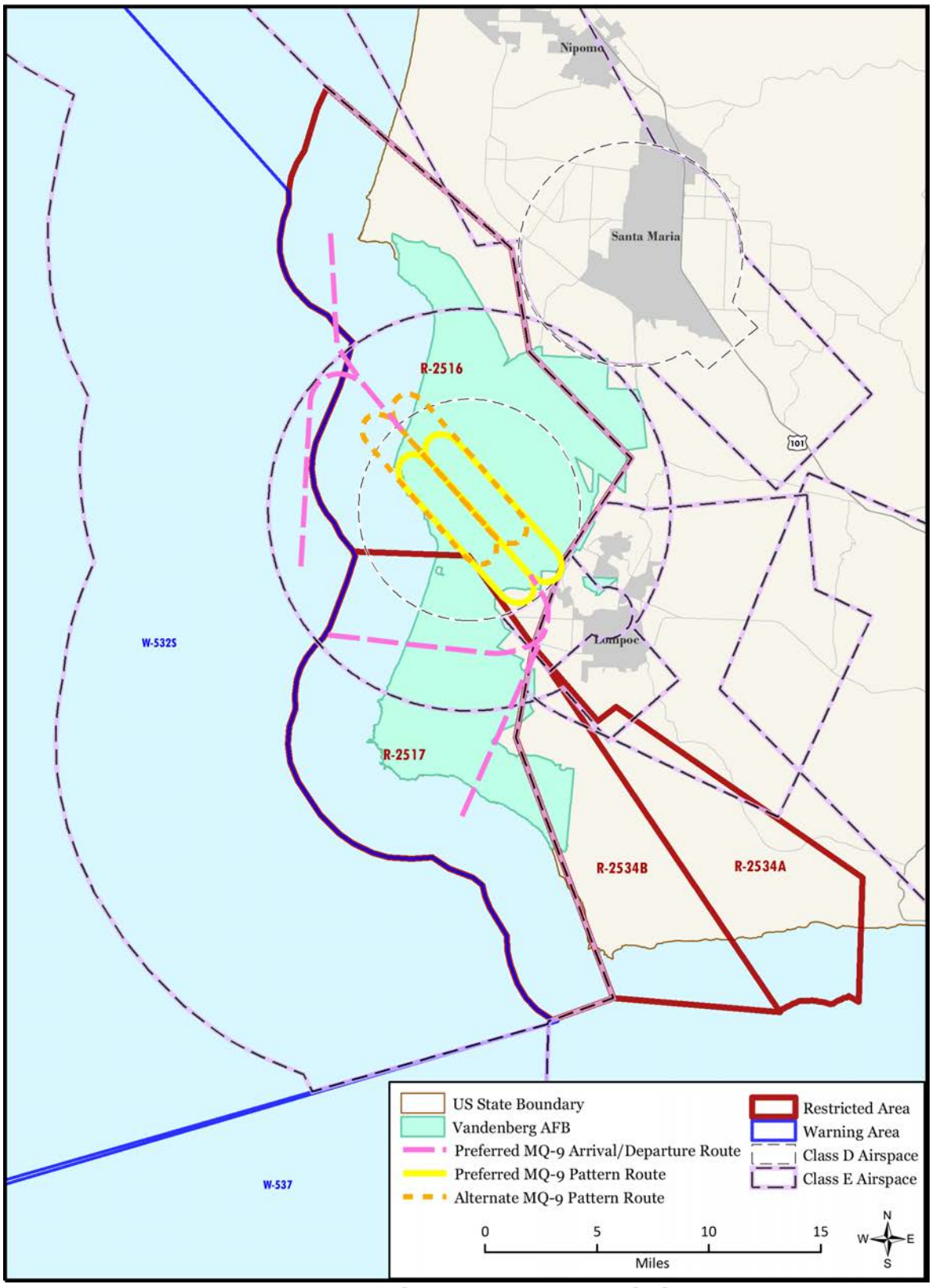

Figure ES-10. Proposed MQ-9 Pattern at Vandenberg AFB

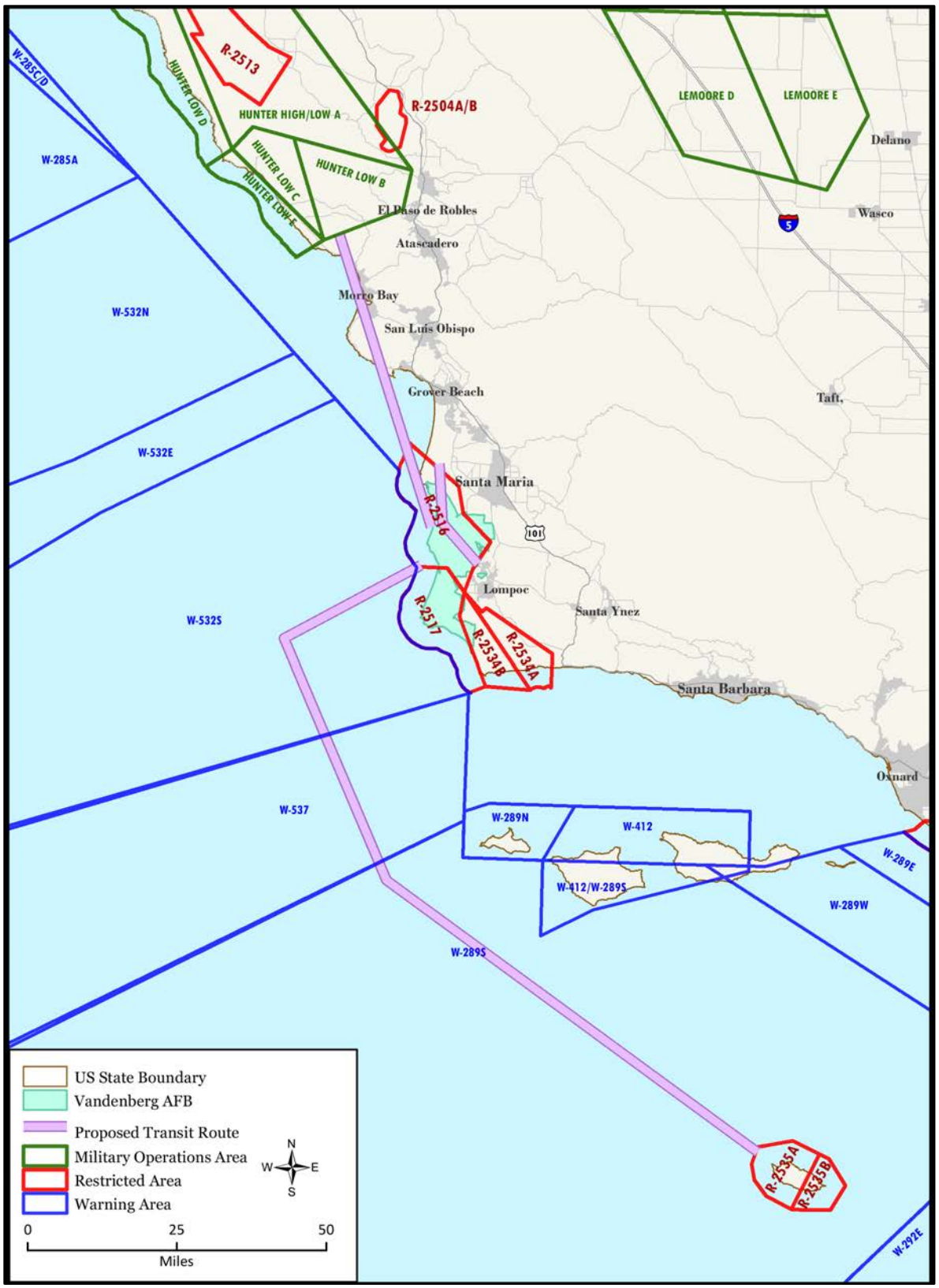

Figure ES-11. Proposed MQ-9 COA Transit Routes to Access Training Ranges from Vandenberg AFB

ES.2.3.4 No Action Alternative for the MQ-9 Wing

No action means that an action would not take place and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. The requirement to address the No Action Alternative is explained in Section ES.2.2.4. No Action means that no facilities construction, personnel changes, or airspace transit and proficiency training would occur at this time at either base.

No action for the MQ-9 Wing proposal in this EIS reflects the affected environment, as described in EIS Sections 3.1 (Tyndall AFB) and EIS Section 3.2 (Vandenberg AFB), where no beddown of an MQ-9 Wing would occur. No MQ-9 facilities construction, personnel changes, or airspace transit and proficiency training would occur at either Tyndall AFB or Vandenberg AFB. The affected environment conditions would be as described in EIS Chapter 3.

ES.2.3.5 Identification of Preferred and Reasonable Alternatives for an MQ-9 Wing Beddown

The USAF's preferred alternative is to beddown the MQ-9 Wing at Tyndall AFB due to its low-risk construction location, lower cost of living for Airmen, and no seasonal sea fog in winter months, in comparison to Vandenberg AFB, that also meets the mission and capacity (e.g., facilities, communications, base operating support) requirements. The USAF has identified the preferred alternative pursuant to 40 CFR 1502.14(e). However, identification of the preferred alternative is not a decision. A decision will be reflected in a ROD at the completion of the EIS process. The ROD will also identify the alternative that is considered to be environmentally preferable.

The USAF decisionmaker will use the information and analysis contained in the EIS to support the decision about how best to satisfy the stated purpose and need within mission constraints. A final determination regarding the MQ-9 Wing beddown will be reflected in the ROD.

ES.2.4 POTENTIAL COMBINED DECISIONS AT TYNDALL AFB

This EIS will be used to provide decisionmakers with the environmental consequences of two independent decisions, which could have combined environmental effects at Tyndall AFB. This section identifies the facilities, personnel, aircraft operations, and training associated with the potential combination of decisions to beddown both an F-35A Wing and an MQ-9 Wing at Tyndall AFB.

ES.2.4.1 Beddown of a Three-Squadron F-35A Wing and an MQ-9 Wing at Tyndall AFB

A combination of independent decisions to beddown a three-squadron F-35A Wing (as described in Section ES.2.2 and an MQ-9 Wing (as described in Section ES.2.3) at Tyndall AFB would result in 72 PAA plus 6 BAI F-35A aircraft and 24 MQ-9 RPA based and operated from Tyndall AFB.

Combined Facilities and Infrastructure. The three-squadron F-35A Wing facilities and infrastructure described in EIS Table 2.2-1 would be constructed at Tyndall AFB, along with the MQ-9 Wing facilities described in EIS Table 2.3-1.

Combined Personnel and Dependents. The combined personnel and dependents for the three-squadron F-35A Wing and MQ-9 Wing would result in a total 4,100 additional personnel. The combined personnel would consist of 469 officers, 3,131 enlisted, 313 DoD civilians, and 187 BOS personnel. The 4,100 personnel would be accompanied by approximately 5,576 dependents, including 2,788 children, of whom approximately 2,049 would be expected to be school-aged.

Combined Airfield Operations and Airspace and Range Use. Three squadrons of F-35A pilots would perform airfield operations as described in Section ES.2.2.2. MQ-9 aircraft would operate as described in Section ES.2.3.1. The annual total airfield operations would be 39,140 plus MQ-9 airfield pattern operations. Airfield operations and training in airspace and ranges, as well as ordnance use, would be as described in Section ES.2.2.2 for three F-35A squadrons and as described in Section ES.2.3.2 for the MQ-9 Wing. The total number of inert munitions deployed on established ranges by 100 F-35A and 200 MQ-9 sorties is estimated to be 600. The F-35A would deploy 31,630 flares in airspace approved for their use. F-35A chaff use is not defined at this time.

ES.2.4.2 Beddown a Four-Squadron F-35A Wing and an MQ-9 Wing at Tyndall AFB

A combination of independent decisions to beddown a four-squadron F-35A Wing as described in Section ES.2.4 and an MQ-9 Wing as described in Section ES.2.3 would result in 96 PAA plus 8 BAI F-35A aircraft and 24 MQ-9 RPA based and operated from Tyndall AFB.

Combined Facilities and Infrastructure. Facilities needed for the fourth squadron could include the same facilities built for a three-squadron alternative but could require additional facilities and infrastructure within the same construction footprint identified in Section ES.2.2.2. The MQ-9 facilities described in Section ES.2.3.2 would also be constructed at Tyndall AFB.

Combined Personnel and Dependents. The combined personnel and dependents for the four F-35A squadrons (see Section ES.2.2.3) and the MQ-9 Wing (see Section ES.2.3.1) would result in an estimated 4,832 incoming personnel. The 4,832 total personnel would be accompanied by approximately 6,572 dependents, including 3,286 children, of whom approximately 2,415 would be expected to be school-aged.

Combined Aircraft Airfield Operations. Four squadrons of F-35As would perform approximately 63 sorties per day, generating an estimated annual 44,586 airfield operations. Approximately 1 percent of the annual flight operations would occur during environmental night (from 10:00 p.m. to 7:00 a.m.). MQ-9 aircraft would be remotely piloted by rotating aircrews during the MQ-9's 12-hour long training mission as described in EIS Section 2.3.1. Because of the long mission duration, an estimated 2,200 of the 2,820 MQ-9 annual sorties would have a departure or arrival during environmental night. The total number of annual airfield operations would be 50,300 plus MQ-9 airfield pattern operations.

Combined Training in Airspace and Ranges. Training in airspace and ranges would be as described in Section ES.2.2.3 for four F-35A squadrons and as described in Section ES.2.3.2 for the MQ-9 Wing. The total number of inert munitions deployed on established ranges by 134 F-35A

and 200 MQ-9 annual sorties is estimated to be 668. The F-35A would deploy 42,174 flares annually in airspace approved for their use. F-35A chaff use is not defined at this time.

ES.2.5 THE ENVIRONMENTAL IMPACT ANALYSIS PROCESS

NEPA requires consideration of environmental issues in federal agency planning and decisionmaking. Under NEPA, federal agencies must prepare an Environmental Assessment or EIS for any major federal action, except those actions that are determined to be "categorically excluded" from further analysis.

This EIS was prepared in accordance with NEPA (42 U.S.C. 4321–4347), the CEQ regulation of 1978 (40 CFR Parts 1500–1508), and 32 CFR Part 989. Title 32 CFR Part 989 establishes the EIAP, which addresses the USAF implementation of NEPA, and AFI 32-1015 directs USAF officials to consider the environmental consequences of any proposed action prior to implementation. The EIAP involves several steps. The EIAP reviews all information pertinent to the Proposed Action and Alternatives and the No Action Alternative and provides a full and fair discussion of potential consequences to the natural and human environment resulting from implementing either or both of the Proposed Actions:

(1) The beddown of an F-35A Operational Wing at Tyndall AFB, Florida (Figure ES-4) and

(2) The beddown of an MQ-9 Operational Wing at either of two alternative locations: Tyndall AFB in Florida (Figure ES-6) or Vandenberg AFB in California (Figure ES-9)

Environmental resources and/or issues of concern that have the potential for impacts include airspace management and air traffic control, noise, health and safety, air quality, hazardous materials and waste, soils and geologic resources, water resources, biological resources, cultural resources, land use and recreation, infrastructure, transportation, socioeconomics, and environmental justice.

ES.2.5.1 Environmental Resources Not Carried Forward for Detailed Analysis

The environmental subject areas listed below do not present a potential for significant environmental impact as there would be no potential for direct, indirect, or cumulative impacts. They will not be carried forward for detailed analysis.

Aesthetics and Visual Resources. Visual resources are defined as the natural and manufactured features that constitute the aesthetic qualities of an area. Any construction that would occur would be located within the existing developed areas of both Tyndall AFB and Vandenberg AFB.

MQ-9 Airspace and Range Operations. Due to the MQ-9's relatively small size, low noise profile, and typical training altitude of between FL200 to FL220 in the COAs and from FL220 to FL260 in approved SUA, it was determined that MQ-9 Airspace and Range Operations do not present a potential for significant environmental impact, and therefore will not be carried forward for detailed quantitative analysis in this EIS. Analysis for potential environmental impact is considered qualitatively in the Airspace Management and Air Traffic Control and Health and Safety sections of this EIS.

ES.2.6 ENVIRONMENTAL COMPARISON OF ALTERNATIVES

Table ES-1 provides a summary comparison of the alternatives for the proposed F-35A Wing beddown at Tyndall AFB, along with the potential combined decisions to beddown both the MQ-9 Wing and F-35A Wing at Tyndall AFB, and the No Action Alternative. Each alternative is compared for each of the environmental resources evaluated in the EIS Chapter 4.

Table ES-2 provides a summary comparison of the two alternative bases for the proposed MQ-9 Wing beddown, along with the No Action Alternative. Each alternative is compared for each of the environmental resources evaluated in the EIS Chapter 4.

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Airspace Management and ATC	No significant impacts to airfield operations or training airspace. A three-squadron F-35A Wing beddown would conduct an estimated 12,300 sorties, which would generate an estimated 33,440 airfield operations. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB. (Section 4.1.1.1)	No significant impacts to airfield operations or training airspace. A four-squadron F-35A beddown would conduct 16,400 sorties, which would generate an estimated 44,600 airfield operations. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB. (Section 4.1.1.2)	No significant impacts to airfield operations or training airspace. An MQ-9 Wing beddown would add 2,820 training sorties to the estimated 12,300 F-35A training sorties, which would add an estimated 5,700 airfield operations to the estimated 33,440 three-squadron F-35A airfield operations. Given the highly regulated manner in which RPA flights are controlled in both the airfield and unrestricted airspace, MQ-9 operations could be safely integrated with F-35A and other aircraft flight activities. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB. (Section 4.3.1.1)	No significant impacts to airfield operations or training airspace. An MQ-9 Wing beddown would add 2,820 training sorties to the estimated 16,400 F-35A training sortie which would add an estimated 5,700 airfield operations to the estimated 44,600 four-squadron F-35A airfield operations. Given the highly regulated manner in which RPA flights are controlled in both the airfield and unrestricted airspace, MQ-9 operations could be safely integrated with F-35A and other aircraft flight activities. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB. (Section 4.3.1.2)	Airfield and training airspace operations under the No Action Alternative would remain at the affected environment levels (17,000 annual operations) described in Section 3.1.1. (Section 4.1.1.3)
Noise	The number of off-base acres of land exposed to noise levels greater than 65 dB DNL would increase from 2 acres to as many as 68 acres, and the number of people exposed would increase from 0 to as many as 80 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, there were 217 off-base acres of land and an estimated 190 people exposed to noise levels greater than 65 dB DNL. Compared to the No Action Alternative (with no active F-22 mission), proposed F-35A operations would result in increased levels at noise-sensitive locations by as much as 14 dB DNL under any of the afterburner take-off scenarios. Noise levels at Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to greater than 65 dB, 70 dB, and 80 dB, respectively, under any afterburner scenario and would result in the same incompatible land uses as existed under pre-hurricane conditions based on DoD guidelines. The DNL at representative noise-sensitive locations would be uniformly lower with the F-35A operations than noise levels under pre-hurricane conditions. Average daytime outdoor speech-interference events would increase from two events per hour to as many as seven events per hour (under any afterburner scenario). To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions. The F-35A operations would result in noise levels at Tyndall Elementary School exceeding criteria for	The number of off-base acres of land exposed to noise levels greater than 65 dB DNL would increase from 2 acres to as many as 93 acres, and the number of people exposed would increase from 0 to as many as 135 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, there were 217 off-base acres of land and an estimated 190 people exposed to noise levels greater than 65 dB DNL. Compared with the No Action Alternative with no active F-22 mission, proposed F-35A operations would result in levels at noise-sensitive locations increasing as much as 15 dB DNL under any of the afterburner take-off scenarios. Noise levels at Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to greater than 70 dB, 70 dB, and 80 dB, respectively, and would result in the same incompatible land uses as existed under pre-hurricane conditions based on DoD guidelines. The DNL noise levels at representative noise-sensitive locations would be uniformly lower with the F-35A operations than noise levels under pre-hurricane conditions. Average daily outdoor speech-interference events would increase from 2 events to as many as 9 to 11 events per average hour (under any afterburner scenario) when compared with the No Action Alternative. To	The number of off-base acres of land exposed to noise levels greater than 65 dB DNL would increase from 2 acres to as many as 69 acres, and the number of people exposed would increase from 0 to as many as 80 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, there were 217 off-base acres of land and an estimated 190 people exposed to noise levels greater than 65 dB DNL Compared with the No Action Alternative with no active F-22 mission, proposed F-35A and MQ-9 operations would result in an increase at noise-sensitive locations by as much as 14 dB DNL under any of the afterburner take-off scenarios. Noise levels at Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to levels louder than 65 dB, 70 dB, and 80 dB, respectively, under any afterburner scenario and would result in the same incompatible land uses as existed under pre-hurricane conditions based on DoD guidelines. The DNL at representative noise-sensitive locations would be uniformly lower with the F-35A and MQ-9 operations than under pre-hurricane conditions. The number of outdoor speech-interference events per hour would increase from two events under the No Action Alternative to as many as seven events (under any afterburner	The number of off-base acres of land exposed to noise louder than 65 dB DNL would increase from 2 acres to as many as 93 acres, and the number of people exposed would increase from 0 to as many as 136 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, 217 off-base acres of land and an estimated 190 people were exposed to noise levels greater than 65 dB DNL The DNL at representative locations would increase by as much as 15 dB under any of the afterburner take-off scenarios relative to the No Action Alternative with no active F-22 mission. Noise at the Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to levels louder than 70 dB, 70 dB, and 80 dB, respectively, and would result in the same incompatible land uses as existed under pre-hurricane conditions based on DoD guidelines. The DNL at representative noise-sensitive locations would be uniformly lower with the F-35A and MQ-9 operations than noise levels under pre-hurricane conditions. The number of outdoor speech-interference events would increase from 2 events per hour to as many as 10 to 12 events per average hour relative to the No Action Alternative. To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions.	Under the No Action Alternative, aircraft operations and noise levels would not increase due to an F-35A Wing beddown. There would be no additional noise impacts to the affected environment from implementation of the No Action Alternative. (Section 4.1.2.3)

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Noise (continued)	classrooms, with exterior school-day noise levels as loud as 75 dB L_{eq-8hr}. The number of events per average hour with potential to interfere with speech with windows open would increase by as many as five to six events per average hour and up to four to five events with windows closed. To put this effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Noise levels at Parker Elementary School would remain below classroom criteria under all afterburner usage scenarios. The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent, compared with 1 percent under the No Action Alternative. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions. Risk of potential hearing loss, workplace noise impacts, or nonauditory health impacts would remain minimal under all afterburner-usage scenarios. The noise level beneath overland training airspace would increase to as much as 48 dB L_{dnmr} (3 dB increase). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. The number of sonic booms in warning areas would decrease with F-35A operations compared with pre-hurricane F-22 flights. (Section 4.1.2.1)	put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions. Noise levels at Tyndall Elementary School would exceed classroom criteria, with exterior school-day noise levels of up to 76 dB L_{eq-8hr}. Events with potential to interfere with speech would increase from one under the No Action Alternative to as many as six events per average hour, with windows open or closed. To put the effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Levels at Parker Elementary School would remain below classroom noise-level criteria under all afterburner scenarios. The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent compared with 1 percent under the No Action Alternative. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions. Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal under all afterburner-usage scenarios. The noise level beneath overland training airspace proposed for regular use would increase by as much as 4 dB (up to 49 dB L_{dnmr}). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. Numbers of sonic booms in warning areas would decrease with F-35A flights as compared with F-22 flights before the hurricane. (Section 4.1.2.2)	scenario). To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions. Noise at Tyndall Elementary School would exceed classroom criteria, with exterior school-day noise levels as loud as 75 dB L_{eq-8hr}. Events with potential to interfere with speech would increase by as many as five to six events per average hour, with windows open or closed, relative to the No Action Alternative with no active F-22 mission. To put the effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Noise at Parker Elementary School would remain below classroom criteria under all afterburner-usage scenarios. The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent compared with 1 percent under the No Action Alternative. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions. Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal under all afterburner-usage scenarios. MQ-9 operations at mission altitude are below typical ambient noise levels and would not add to overall noise beneath overland training airspace from subsonic aircraft operations. F-35A operations increase noise up to as much as 48 dB L_{dnmr} (a 3-dB increase). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. Numbers of sonic booms in warning areas would decrease with F-35A operations compared with pre-hurricane F-22 flights. (Section 4.3.2.1)	Noise at Tyndall Elementary School would exceed classroom criteria, with exterior school-day noise levels of up to 76 dB L_{eq-8hr}. Events with potential to interfere with speech would increase from one under the No Action Alternative to as many as six to eight events per average hour (with windows open) or six to seven events per average hour (with windows closed) relative to the No Action Alternative. To put the effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Noise at Parker Elementary School would remain below classroom criteria under all afterburner-usage scenarios. The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent compared to the No Action Alternative with no active F-22 mission. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions. Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal under all afterburner-usage scenarios. Noise from MQ-9 operations at mission altitude are below typical ambient noise levels and would not add to overall subsonic aircraft operations noise levels beneath overland training airspace. F-35A operations would increase noise up to as much as 49 dB L_{dnmr} (a 4-dB increase). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. Numbers of sonic boom in warning areas would decrease with F-35A operations as compared with pre-hurricane F-22 flights. (Section 4.3.2.2)	

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Health and Safety	No significant impacts would occur. Initiation of F-35A flight operations compared with 17,000 annual flight operations under the No Action Alternative would result in an increase from approximately 6 to an estimated 17 BASH incidents per year. BASH incidents would be comparable to the average of 20 incidents per year prior to 2018. Based on the projected Class A mishap rate, the three-squadron Wing would have an estimated annual average of 0.43 Class A mishaps training over water and 0.14 Class A mishaps over land. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible. (Section 4.1.3.1)	No significant impacts would occur. Initiation of F-35A flight operations would result in an increase from approximately 6 to an estimated 20 BASH incidents per year, the same as the average prior to 2018. Based on the projected Class A mishap rate, the four-squadron Wing would have an estimated annual average of 0.57 Class A mishaps training over water and 0.19 Class A mishaps over land. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible. (Section 4.1.3.2)	No significant impacts would occur. Initiation of F-35A flight operations would result in an increase from approximately 6 to an estimated 19 BASH incidents per year, the same as the average prior to 2018. Based on the projected Class A mishap rates and combined operations, there would be a statistical increase in the potential for aircraft mishaps compared with No Action. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible. There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft ("lost-link"). Under such circumstances, aircraft are programmed to return to base for direct line-of-sight control. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., over low population or military-controlled lands or over water) would minimize any impacts. (Section 4.3.3.1)	No significant impacts would occur. Initiation of F-35A flight operations would result in an increase from approximately 6 to an estimated 21 BASH incidents per year, the same as the average prior to 2018. Based on the projected Class A mishap rates and combined operations, there would be a statistical increase in the potential for aircraft mishaps compared with No Action. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible. There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft ("lost-link"). Under such circumstances, aircraft are programmed to return to base for direct line-of-sight control. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., over low population or military-controlled lands or over water) would minimize any impacts. (Section 4.3.3.2)	Under the No Action Alternative, flight activity would be as described for the affected environment (Section 3.1.1). No F-35A–related personnel changes or construction would occur. All aspects of ground safety and safety in the airspace would continue as described in Section 3.1.3. (Section 4.1.3.3)
Air Quality	Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality. Annual operational emissions of VOCs, SO_x, PM_{10}, NO_x, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 0.8 percent change (increase) in the total CO emissions generated within Bay County in 2017 and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions. Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality. (Section 4.1.4.1)	Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality. Annual operational emissions of VOCs, SO_x, PM_{10}, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO and NO_x would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 1.1 and 3.5 percent change (increase) in the total CO and NO_x emissions generated within Bay County in 2017, respectively, and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO and NO_x emissions produced by Tyndall	Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality Annual operational emissions of VOCs, SO_x, PM_{10}, NO_x, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 1.0 percent change (increase) in the total CO emissions generated within Bay County in 2017 and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions.	Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality Annual operational emissions of VOCs, SO_x, PM_{10}, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO and NO_x would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 1.2 and 3.6 percent change (increase) in the total CO and NO_x emissions generated within Bay County in 2017, respectively, and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO and NO_x emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions.	Air quality impacts would be the same as those described for the affected environment. No F-35A–related changes that could affect air quality would occur at Tyndall AFB or in the associated airspace. (Section 4.1.4.3)

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Air Quality (continued)		AFB in 2017 in comparison to the 2017 Bay County emissions. Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality. (Section 4.1.4.2)	Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality. (Section 4.3.4.1)	Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality. (Section 4.3.4.2)	
Hazardous Materials and Waste	Minor hazardous materials and wastes would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations. (Section 4.1.5.1)	Minor hazardous materials and wastes would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations. (Section 4.1.5.2)	Minor hazardous materials and wastes would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations. (Section 4.3.5.1)	Minor hazardous materials and wastes would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations. (Section 4.3.5.2)	The management of hazardous materials and the generation of hazardous waste at Tyndall AFB would continue as described for the affected environment in Section 3.1.5. No impacts to hazardous materials or waste. (Section 4.1.5.3)
Soils and Geologic Resources	Up to 130.3 acres of previously disturbed land could be temporarily disturbed due to construction of 26.2 acres of base facilities. Implementing standard construction practices in accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring. (Section 4.1.6.1)	Up to 130.3 acres of previously disturbed land could be temporarily disturbed due to construction of approximately 27 acres of base facilities. Implementing standard construction practices in accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring. (Section 4.1.6.2)	Construction required for the F-35A and MQ-9 combined actions would temporarily disturb 276.1 acres for a 37.3-acre footprint with MQ-9 Maintenance Complex Option 1 or 834 acres for an approximately 50-acre footprint with MQ-9 Maintenance Complex Option 2. Implementing standard construction practices in accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring. (Section 4.3.6.1)	Construction required for the F-35A and MQ-9 combined actions would temporarily disturb 276 acres for an approximately 39-acre footprint with MQ-9 Maintenance Complex Option 1 or 834 acres for an approximately 50-acre footprint with MQ-9 Maintenance Complex Option 2. Implementing standard construction practices in accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring. (Section 4.3.6.2)	No F-35A–related impacts to soils and geologic resources. (Section 4.1.6.3)
Water Resources	There would be no significant impacts to water resources. BMPs to control erosion and runoff during construction would minimize impacts to water resources resulting from constructing 0 to 23 acres of new impervious surfaces, depending on facility siting. LID in facility design (mandatory for facilities over 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program. (Section 4.1.7.1)	There would be no significant impacts to water resources. BMPs to control erosion and pollution during construction would minimize impacts to water resources resulting from constructing 0 to 28 acres of new impervious surfaces, depending on facility siting. LID in facility design (mandatory for facilities over 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program. (Section 4.1.7.2)	Water resources could be affected differently depending on the MQ-9 option. Construction of the F-35A and MQ-9 facilities on the main runway would disturb at least 48 acres of land and, depending on facility siting, resulting in 10.5 to 42.5 acres of new impervious surfaces. With the F-35A Wing beddown MQ-9 Alternate Runway Option, construction would disturb at least 276 acres of land and, depending on facility siting, result in 27 to 50 acres of new impervious surfaces. BMPs and LID methods employed to control erosion and pollution during construction would minimize impacts to water resources under this combination of alternatives. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program. (Section 4.3.7.1)	Water resources could be affected differently depending on the MQ-9 option. Construction of the F-35A and MQ-9 facilities on the main runway would disturb approximately 276 acres of land and, depending on facility siting, result in 10.5 to 44.5 acres of new impervious surfaces. With the F-35A beddown, MQ-9 Alternate Runway Option, construction would disturb approximately 834 acres of land and, depending on facility siting, result in 27 to 52 acres of new impervious surfaces. BMPs and LID methods employed to control erosion and pollution during construction would minimize impacts to water resources under this combination of alternatives. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program. (Section 4.3.7.2)	No land disturbance or development would occur, and there would be no F-35A–related impacts to water resources. (Section 4.1.7.3)

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Biological Resources	Construction of facilities would result in the loss of up to 8.5 acres of vegetation/wildlife habitat and loss of up to 3.3 acres of wetlands. No adverse effects to sensitive species would occur. (Section 4.1.8.1)	Construction of facilities would result in the loss of up to 8.5 acres of vegetation/wildlife habitat and loss of up to 3.3 acres of wetlands. No adverse effects to sensitive species would occur. (Section 4.1.8.2)	Construction of facilities would result in the loss of up to 33.5 acres of vegetation/wildlife habitat and loss of up to 11.4 acres of wetlands (MQ-9 Maintenance Complex Option 1) or loss of up to 629.5 acres of vegetation/ wildlife habitat and 306.7 acres of wetlands (Maintenance Complex Option 2). No adverse effects to sensitive species would occur under MQ-9 Maintenance Complex Option 1. Under MQ-9 Maintenance Complex Option 2, potential impacts to the federally listed Godfrey's butterwort species that may be present could occur. (Section 4.3.8.1)	Construction of facilities would result in the loss of up to 33.5 acres of vegetation/wildlife habitat and loss of up to 11.4 acres of wetlands (MQ-9 Maintenance Complex Option 1) or loss of up to 629.5 acres of vegetation/wildlife habitat and 306.7 acres of wetlands (Maintenance Complex Option 2). No adverse effects to sensitive species would occur under MQ-9 Maintenance Complex Option 1. Under MQ-9 Maintenance Complex Option 2, potential impacts to the federally listed Godfrey's butterwort species that may be present could occur. (Section 4.3.8.2)	No F-35A–related impacts to wildlife habitat, wetlands, or federally listed species. (Section 4.1.8.3)
Cultural Resources	There are no historic properties in the APE for direct impacts; there would be no adverse effect to NRHP-listed or -eligible resources. (Section 4.1.9.1)	There are no historic properties in the APE for direct impacts; there would be no adverse effect to NRHP-listed or -eligible resources. (Section 4.1.9.2)	There are no historic properties in the APE for direct impacts; there would be no adverse effect to NRHP-listed or -eligible resources in the APE for indirect impacts. (Section 4.3.9.1)	There are no historic properties in the APE for direct impacts; there would be no adverse effect to NRHP-listed or -eligible resources in the APE for indirect impacts. (Section 4.3.9.2)	No ground-disturbing activities and no change in airspace use. No F-35A–related impact to cultural resources. (Section 4.1.9.3)
Land Use and Recreation	*Land Use* On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 61 and 68 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 10 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This is less acreage than had been exposed to comparable noise levels before the hurricane. No land use effects from small differences in afterburner off-base noise. The USAF is working closely with the off-base communities to provide information which can be used for community land use planning decisions. Additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane but could meet new development demands. *Recreation* Few impacts in local off-base recreational areas (park) from noise similar to, or less than, pre-hurricane levels. A small part of Shell Island within St Andrew State Park would be exposed to noise of 65 dB DNL. (Section 4.1.10.1)	*Land Use* On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 84 and 93 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 18 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This is less acreage than had been exposed to comparable noise levels before the hurricane. No land use effects from small differences in afterburner off-base noise. The USAF is working closely with the off-base communities to provide information which can be used for community land use planning decisions. Additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane, and demand could increase the strain on local resources in the midst of ongoing hurricane recovery.	*Land Use* On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 61 and 68 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 10 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This acreage is less than had been exposed to comparable noise levels before the hurricane. No land use effects from small differences in afterburner off-base noise. The USAF is working closely with the off-base communities to provide information which can be used for community land use planning decisions. Additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane, and demand could increase the strain on local resources in the midst of	*Land Use* On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 84 and 93 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 18 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This is fewer acres than had been exposed to comparable noise levels before the hurricane. No land use effects from small differences in afterburner off-base noise. The USAF is working closely with the off-base communities to provide information which can be used for community land use planning decisions. Additional military households would create a need for off-base housing and could generate a need for residential development. Available residential land is limited due to hurricane damage, and residential land could become more difficult to develop. Shortages of residential land could increase the time and cost	*Land Use* There would be no F-35A mission at Tyndall Noise levels above 65 dB DNL would not affect any off-base areas. There would be no mission-induced new off-base housing. *Recreation* No F-35A–related effects to off-base recreation from existing use by USAF personnel. (Section 4.1.10.3)

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Land Use and Recreation (continued)		Some residents living in areas underlying training airspace or long-term visitors to the Mud Swamp Wilderness Area could be annoyed by additional overflights and associated noise. *Recreation* Few impacts in local off-base recreational areas (park) from noise similar to, or less than, pre-hurricane levels. A small part of Shell Island within St Andrew State Park would be exposed to noise of 65 dB DNL. (Section 4.1.10.2)	ongoing hurricane recovery. Possible moderate impact on local land use. Some residents living in areas underlying training airspace or long-term visitors to the Mud Swamp Wilderness Area could be annoyed by additional overflights and associated noise. *Recreation* The projected increase in 3,942 military households living off base could result in increased demand for community recreational resources (parks, playgrounds, public recreational centers, swimming pools, etc.). Military personnel would continue to use on base recreational resources. (Section 4.3.10.1)	to develop new housing. Possible high impact on local land use. Some residents living in areas underlying training airspace or long-term visitors to the Mud Swamp Wilderness Area could be annoyed by additional overflights and associated noise. *Recreation* The projected increase in 4,646 military households living off base could result in moderate impacts to community recreational resources (parks, playgrounds, public recreational centers/swimming pools, etc.). Potential for moderate impact on local recreational resources. Military personnel would continue to use on base recreational resources. (Section 4.3.10.2)	
Infrastructure	There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions. (Section 4.1.11.1)	There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions. (Section 4.1.11.2)	There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions. Contracts with Bay County for potable water and wastewater service would need to be revised to reflect higher demands for service. (Section 4.3.11.1)	There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions. Contracts with Bay County for potable water and wastewater service would need to be revised to reflect higher demands for service. Additional interconnection capacity with Bay County may be needed for potable water, and storage requirements may increase on base as a result of new building construction and personnel increases. (Section 4.3.11.2)	No construction or personnel increase would occur. The use of utilities and power and waste generation would be substantially below capacity after base reconstruction following the hurricane. No F-35A–related impacts to the Tyndall AFB reconstructed infrastructure system. (Section 4.1.11.3)
Transportation	Additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue, particularly during the morning and afternoon peak periods, would become LOS F. The intersection would experience significant impacts, up to 10 minutes of delay, from morning right turns onto Airey Avenue and evening left turns onto US-98. A segment of US-98 would exceed capacity (LOS F) during the morning peak period and would be at capacity (LOS E) during the afternoon peak period. (Section 4.1.12.1)	Additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98 would result in LOS F at the intersection and along US-98 during both peak periods. Delays would be significant under this alternative (over 11 minutes of control delay at the intersection), with volume-to-capacity (V/C) ratios of more than 2.0. (Section 4.1.12.2)	For the F-35A beddown in combination with the MQ-9 Main Runway Option: The combination of alternatives would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98. The LOS would decrease to LOS F for all analyzed facilities. Delays would be significant under this alternative (over 11 minutes of control delay at the intersection), with V/C ratios of up to 2.7 at the intersection. F-35A beddown in combination with the MQ-9 Alternate Runway Option: The combination of alternatives would generate additional traffic at the intersection of US-98,	For the F-35A beddown in combination with the MQ-9 Main Runway Option: The combination of alternatives would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98. The LOS would decrease to LOS F for all analyzed facilities. Delays would be significant under this alternative (nearly 11 minutes of control delay at the intersection), with V/C ratios of up to 3.0 at the intersection. For the F-35A beddown in combination with the MQ-9 Alternate Runway Option: The combination of alternatives would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along	No mission-related construction or personnel increases would occur. Traffic conditions for the intersection of US-98 and Tyndall Drive would be acceptable (LOS C), although LOS D could occur during the afternoon peak period. No F-35A–related impacts to the Tyndall AFB transportation system would result from implementation of the No Action Alternative. (Section 4.1.12.3)

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Transportation (continued)			Tyndall Drive, and Airey Avenue and along US-98. A new gate would be included on US-98 that would divert a portion of the traffic from the main gate and lessen the impact at the main gate. However, the LOS would still decrease to LOS F for all analyzed facilities. The combination of the F-35A beddown with either MQ-9 beddown option would result in significant impacts. (Section 4.3.12.1)	US-98. A new gate would be included on US-98 that would divert a portion of the traffic from the main gate and lessen the impact at the main gate. However, the LOS would still decrease to LOS F for all analyzed facilities. The combination of the F-35A beddown with either MQ-9 beddown option would result in significant impacts. (Section 4.3.12.2)	
Socioeconomics	A total increase of 2,200 USAF personnel would occur at a rate of 550 personnel per year from 2022 through 2025. There would be a total of 2,992 dependents including 1,496 children. The estimated 1,100 school-age children would increase enrollment in Bay County schools by an estimated 275 students per year from 2022 through 2025. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 1,206 jobs, or approximately 302 jobs added per year from 2022 through 2025. Construction costs for F-35A facilities of $320 million would result in a total of direct, indirect, and induced jobs of approximately 657 jobs in 2021, rising to 1,288 to 1,239 jobs from 2022 through 2024. This alternative would result in an estimated on-base and off-base increase in jobs of 657 in 2021, to 2,140 in 2022, increasing to 3,795 jobs in 2024, peaking at 5,008 jobs in 2025, and then leveling off at approximately 3,406 jobs after 2025. There would be an annual demand for USAF off-base housing, stabilizing at 2,019 additional units by 2025. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,630 housing units in the community for the years 2022 through 2025. Adding that to the 2025 USAF off-base housing demand of 2,019 would result in a total demand of 3,649 units by the end of 2024. Housing demand would be reduced to represent total housing demand for 2,019 off-base USAF personnel plus 804 secondary personnel, for a demand for 2,823 housing units after 2025. There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 11 policemen, 8 firemen, and 14 medical	A total increase of 2,933 USAF personnel would occur at a rate of 587 personnel per year from 2022 through 2026. There would be a total of 3,988 dependents including 1,994 children. The estimated 1,466 school-age children would increase enrollment in Bay County schools by an estimated 293 students per year from 2022 through 2026. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 1,609 jobs, or approximately 322 jobs added per year from 2022 through 2026. Construction costs for F-35A facilities of $400 million would result in a total of direct, indirect, and induced jobs of approximately 1,314 jobs in 2021, declining to 1,191 jobs in 2025 before completing construction. This alternative would result in an estimated on-base and off-base increase in jobs of 1,314 in 2021, to 3,966 in 2024, and then leveling off at approximately 4,542 jobs from 2026 and onward. There would be an annual demand for USAF off-base housing, stabilizing at 2,690 additional units by 2026. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,899 housing units in the community for the years 2022 through 2025. Adding this to the 2025 USAF off-base housing demand of 2,690 would result in a total demand of 4,589 units by the end of 2024.	An increase of 4,100 USAF personnel would be accompanied by 5,576 dependents including 2,788 children. The estimated 2,049 school-age children would substantially increase enrollment in Bay County schools. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 2,284 jobs, or approximately 571 jobs added per year from 2022 through 2025. Construction costs for Three-Squadron F-35A and MQ-9 facilities of $720 million would create secondary employment. The estimated total increase in on-base and off-base jobs would be 1,642 in 2021 up to 9,172 jobs by the beginning of 2025, and then level off at approximately 6,384 jobs from 2026 and onward. There would be an annual demand for USAF off-base housing, stabilizing at 3,608 additional units by the end of 2026. Construction workers and secondary employees would also demand housing. The additional demand by construction and secondary workers would be for up to 3,382 housing units in the community by the end of 2024. Adding that to the 2025 USAF off-base housing demand of 3,608 would result in a total demand of 6,990 units by 2026. The demand for construction labor would exceed the county's capacity and require additional in-migration of personnel. In-migrating construction workers would compete for housing and other services with other Bay County residents. Housing costs in the next several years could continue rising by 10 to 15 percent or more per year as supply tries to catch up with	A total increase of 4,832 USAF personnel would occur at a rate of 1,063 personnel per year from 2022 through 2025 plus 800 personnel in 2026. There would be a total of 6,572 dependents including 3,286 children. The estimated 2,415 school-age children would substantially increase enrollment in Bay County schools by an estimated 532 students per year from 2022 through 2025 and 293 students in 2026. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 2,689 jobs, or approximately 592 jobs added per year from 2022 through 2025 and 321 jobs in 2026. Construction costs for Four Squadron F-35A and MQ-9 facilities of $800 million would create direct, indirect, and induced employment and earnings. The estimated total increase in USAF on-base and secondary off-base jobs would be 2,299 in 2021 up to 9,403 jobs at the end of 2024, and then level off at approximately 7,522 jobs from 2026 and onward. There would be an annual demand for USAF personnel off-base housing, stabilizing at 4,280 additional units by 2026. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 3,438 housing units in the community by the beginning of 2025. Adding that to the 2025 USAF off-base housing demand of 4,280 would result in a peak demand of 7,718 units by 2025. The demand for construction labor would exceed the county's capacity and require additional in-migration of personnel. In-migrating construction workers would compete for	Socioeconomic resources conditions would be as described for the affected environment in Section 3.1.13. There would continue to be 2,200 USAF employees at Tyndall AFB and no construction of facilities for the F-35A or MQ-9 Wing beddowns. (Section 4.1.13.3)

Table ES-1. Comparison of Alternatives for the Proposed F-35A Wing Beddown at Tyndall AFB

Environmental Resource	F-35A at Tyndall AFB Three-Squadron F-35A Wing Alternative	F-35A at Tyndall AFB Four-Squadron F-35A Wing Alternative	F-35A and MQ-9 at Tyndall AFB Three-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A and MQ-9 at Tyndall AFB Four-Squadron F-35A Wing Alternative and MQ-9 at Tyndall AFB Alternative	F-35A at Tyndall AFB No Action Alternative
Socioeconomics (continued)	personnel to support off-base USAF families by 2026. There could be a substantially greater number of personnel needed during construction. (Section 4.1.13.1)	Housing demand would be reduced to represent a secondary employee demand for 1,073 plus the USAF demand for 2,690 housing units, for a total off-base demand for 3,763 housing units from 2026 and onward. There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 15 policemen, 11 firemen, and 18 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. (Section 4.1.13.2)	demand before leveling off, or even declining, as construction workers no longer contribute to housing demand. USAF-related direct and secondary off-base housing demand would decline to 5,131 units after 2026. There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 21 policemen, 15 firemen, and 25 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. (Section 4.3.13.1)	housing and other services with other Bay County residents. Housing costs in the next several years could continue rising by 10 to 15 percent or more per year as supply tries to catch up with demand before leveling off, or even declining, as construction workers no longer contribute to housing demand. USAF direct and secondary off-base housing demand would decline to 6,073 units from 2026 and onward. There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 25 policemen, 17 firemen, and 29 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. (Section 4.3.13.2)	
Environmental Justice	The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise. The increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected. There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction. No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions. (Section 4.1.14.1)	The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise. The increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected. There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction. No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions. (Section 4.1.14.2)	MQ-9 flight operations do not add to off-base noise. The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise. The large increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected. There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction. No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions. (Section 4.3.14.1)	MQ-9 flight operations do not add to off-base noise. The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise. The substantial increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected. There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction. No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions. (Section 4.3.14.2)	There would be no disproportionate noise effect to minority or low-income populations as a result of the No Action Alternative. There are no residential land areas or populations impacted by noise levels of 65 dB DNL associated with affected environment aircraft operations at Tyndall AFB. Without an influx of students, schools would continue to face budget constraints. (Section 4.1.14.3)

Key: AFB = Air Force Base; APE = Area of Potential Effects; APZ = Accident Potential Zone; ATC = Air Traffic Control; BASH = bird/wildlife aircraft strike hazard; BMPs= best management practices; CO = carbon monoxide; COA = Certificate of Authorization; COC = Community of Comparison; dB = decibels; DNL = day-night average sound level; DoD = Department of Defense; ERP = Environmental Restoration Program; L_{dnmr} = onset rate-adjusted monthly day-night average sound level; $L_{eq\text{-}8hr}$ = 8-hour equivalent noise level; LID = Low Impact Development; LOS = level of service; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; NO_x = nitrogen oxides; NPDES = National Pollutant Discharge Elimination System; NRHP = National Register of Historic Places; PM_{10}, = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ROI = region of influence; RPA = remotely piloted aircraft; SO_x,= sulfur oxides; SUA = Special Use Airspace; SWPPP = Storm Water Pollution Prevention Plan; US-98 = U.S. Highway 98; USAF = U.S. Air Force; V/C = volume-to-capacity; VOCs = volatile organic compounds

Note: The pre-hurricane conditions of 2018 are presented for some resource areas, where it would be useful as a point of comparison to provide context to the environmental impacts for the local public and decisionmakers.

Table ES-2. Comparison of Alternatives for the Proposed MQ-9 Wing Beddown (Tyndall AFB or Vandenberg AFB)

Environmental Resource	MQ-9 Tyndall AFB Alternative	MQ-9 Vandenberg AFB Alternative	MQ-9 No Action Alternative
Airspace Management and ATC	No significant impacts to airfield operations or training airspace. An MQ-9 Wing at Tyndall AFB would generate an estimated 5,700 airfield operations plus any additional practice takeoffs/landings and 2,820 sortie operations in the training airspace and required COAs. The conduct of these operations in any airspace environment would adhere to the strict UAS requirements governing these flights. This includes the manner in which ATC and RPA operators must closely monitor and control these flights throughout all flight activities. Tyndall AFB has the airfield and airspace capabilities for supporting the MQ-9 Wing beddown and its operational requirements without impacting other manned aircraft operations and airspace uses. (Section 4.2.1.1)	No significant impacts to airfield operations or training airspace. An MQ-9 Wing at Vandenberg AFB would generate an estimated 5,700 airfield operations plus any additional practice takeoffs/landings and 2,820 sortie operations in the training airspace and required COAs. The conduct of these operations in any airspace environment would adhere to the strict UAS requirements governing these flights. This includes the manner in which ATC and RPA operators must closely monitor and control these flights throughout all flight activities. Vandenberg AFB has the airfield and airspace capabilities for supporting the MQ-9 beddown and its operational requirements without impacting other manned aircraft operations and airspace uses. (Section 4.2.2.1)	There would be no MQ-9 related impacts at either Tyndall AFB or Vandenberg AFB. Airfield and training airspace uses by the differing flight activities conducted at Tyndall AFB and Vandenberg AFB would remain at the representative affected environment levels. (Sections 4.2.1.3 and 4.2.2.2)
Noise	Noise levels exceeding 65 dB DNL would not extend off base. MQ-9 overflights under the Main Runway or Alternate Runway Option would increase the number of outdoor noise events, with potential to interfere with speech momentarily, by up to three events per hour at the locations studied relative to the No Action Alternative with minimal flying operations. Noise levels at Tyndall Elementary School would remain above the recommended maximum noise level, and noise at Parker Elementary School would remain below criteria levels under both options. The number of events per hour at Tyndall Elementary School with potential to interfere with speech would be two with windows open or closed under the Main Runway Option and one under the Alternate Runway Option. The probability of people being awakened at least once per night by MQ-9 operations at the Tyndall AFB Dormitories and residential areas in the vicinity of Tyndall Elementary School would increase from 0 to 1 percent under the Main Runway Option and would remain near 0 percent at all locations under the Alternate Runway Option. Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal. MQ-9 operations at mission altitude are below typical ambient noise levels and do not add to overall subsonic-aircraft-operations noise levels beneath overland training airspace. (Section 4.2.1.3)	Noise levels exceeding 65 dB CNEL (or DNL) would not extend off base. Noise levels at representative noise-sensitive locations near Vandenberg AFB would increase by as much as 2 dB to 48 dB (similar to 45-dB noise levels typical in rural areas). MQ-9 overflights would increase the number of outdoor noise events, with potential to interfere with speech momentarily, by up to three events per hour at the locations studied. Outdoor noise levels at Crestview Elementary School and Maple High School would remain below 60 dB $L_{eq\text{-}8hr}$ under the Proposed Action. The probability of sleep disturbance at the representative noise-sensitive locations would continue near zero. Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal. MQ-9 operations at mission altitude are below typical ambient noise levels and do not add to overall subsonic-aircraft-operations noise levels beneath overland training airspace. (Section 4.2.2.3)	Under the No Action Alternative, aircraft operations and noise levels would not increase due to an MQ-9 Wing beddown. There would be no MQ-9–related acoustic impacts at either Tyndall AFB or Vandenberg AFB from implementation of the No Action Alternative. (Sections 4.2.1.4 and 4.2.2.4)
Health and Safety	There is a potential increase of BASH events with additional flight operations. The 5,900 MQ-9 flight operations would be calculated to result in 2 additional BASH incidents per year. There are approximately 6 BASH incidents per year with No Action. There could be one calculated Class A incident every 1.2 years. There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft (“lost-link”). The aircraft is programmed to return to the vicinity of the base so that direct line-of-sight communication can be restored. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., low public presence) would minimize any impacts. All planned training and construction activities would be accomplished by technically qualified personnel and conducted in accordance with applicable USAF, state, and federal safety standards and requirements. No significant impacts would be anticipated. (Section 4.2.1.5)	There is potential increase of BASH events with additional flight operations. The 5,900 MQ-9 flight operations would be calculated to result in fewer than 2 additional BASH incidents per year. Animals and birds would become accustomed to increased airfield operations by a relatively slow aircraft and would be able to avoid the MQ-9. There could be one calculated Class A incident every 1.2 years. There is an average of fewer than 2 BASH incidents per year with No Action. There would be one calculated Class A incident every 1.2 years. There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft (“lost-link”). The aircraft is programmed to return to the vicinity of the base so that direct line-of-sight communication can be restored. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., low public presence) would minimize any impacts. All planned training and construction activities would be accomplished by technically qualified personnel and conducted in accordance with applicable USAF, state, and federal safety standards and requirements. No significant impacts would be anticipated. (Section 4.2.2.5)	There would be no MQ-9 related impacts to flight- or ground-safety at either Tyndall AFB or Vandenberg AFB. Ground operations would continue to be conducted using the same safety processes and procedures as under current operations. (Sections 4.2.1.6 and 4.2.2.6)
Air Quality	Total annual construction and operational emissions would be below all initial indicators of potential significance. This alternative would not result in any significant impacts to air quality. (Section 4.2.1.7)	Total annual construction and operational emissions would be below all initial indicators of potential significance. This alternative would not result in any significant impacts to air quality. (Section 4.2.2.7)	There would be no MQ-9-related air quality impacts at either Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.8 and 4.2.2.8)
Hazardous Materials and Waste	Minor hazardous materials and wastes would be generated from demolition, construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would follow USAF regulations. (Section 4.2.1.9)	Minor hazardous materials and wastes would be generated from demolition, construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within ERP Site AOC-147 would follow USAF regulations. (Section 4.2.2.9)	There would be no MQ-9-related hazardous materials or waste impacts at either Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.10 and 4.2.2.10)

Table ES-2. Comparison of Alternatives for the Proposed MQ-9 Wing Beddown (Tyndall AFB or Vandenberg AFB)

Environmental Resource	MQ-9 Tyndall AFB Alternative	MQ-9 Vandenberg AFB Alternative	MQ-9 No Action Alternative
Soils and Geologic Resources	Up to 120.7 (Maintenance Complex Option 1) or 678.9 (Maintenance Complex Option 2) acres could be temporarily disturbed due to construction. Facility footprints within the disturbed areas total approximately 23 acres for either option. Implementing standard construction practices would result in no significant impacts to soils or geologic resources. (Section 4.2.1.11)	Potential construction impacts include the disturbance of at least 50 acres and creation of approximately 21 acres of impervious surfaces. Implementing standard construction practices would result in no significant impacts to soils or geologic resources. (Section 4.2.2.11)	There would be no MQ-9–related impacts to soils or geologic resources at either Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.12 and 4.2.2.12)
Water Resources	Up to 120.7 (Maintenance Complex Option 1) or 678.9 (Maintenance Complex Option 2) acres could be temporarily disturbed due to construction. Facility footprints within the disturbed areas total approximately 23 acres for either option. The incorporation of BMPs to control erosion and pollution during construction would reduce impacts to water resources. The incorporation of LID in facility design (mandatory for facilities over 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. There would be no significant impacts to water resources. This alternative would be consistent with the enforceable policies of Florida's Coastal Management Program. (Section 4.2.1.13)	Construction would result in the addition of 25 acres of new impervious surfaces. The incorporation of BMPs to control erosion and pollution during construction would reduce impacts to water resources. The incorporation of LID in facility design (mandatory for facilities over 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. There would be no significant impacts to water resources. There would be no effects to California coastal uses or resources. (Section 4.2.2.13)	There would be no MQ-9–related land disturbance or development and no impacts to water resources at Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.14 and 4.2.2.14)
Biological Resources	Construction of facilities would result in the loss of up to 25 acres of vegetation/wildlife habitat and loss of up to 8.1 acres of wetlands under Maintenance Complex Option 1. No adverse impacts to sensitive species would occur. Construction under Maintenance Complex Option 2 would result in the loss of up to 621 acres of vegetation/wildlife habitat and up to 303.4 acres of wetlands. Potential impacts to the federally listed Godfrey's butterwort that may be present within the proposed location of the Maintenance Complex Option 2 and within the MSA could occur. Flight operations are not expected to impact any sensitive species. (Section 4.2.1.15)	Facility construction would result in impacts to biological resources with Maintenance Complex construction resulting in loss of up to 52.3 acres of vegetation/wildlife habitat. No impacts to federally jurisdictional wetlands would occur. A determination of "may affect, not likely to adversely affect" has been made for three federally listed species and a determination of "may affect, likely to adversely affect" has been made for an additional three species (Section 4.2.2.15). The USFWS has issued a Biological Opinion concurring with these determinations.	There would be no MQ-9–related impacts to wildlife habitat, wetlands, or federally listed species at Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.16 and 4.2.2.16)
Cultural Resources	There are no historic properties in the APE; there would be no adverse effect to historic properties. (Section 4.2.1.17)	There are no known historic properties in the APE; there would be no adverse effect to historic properties. (Section 4.2.2.17)	No ground disturbing activities and no change in airfield operations. There would be no MQ-9–related impacts to cultural resources at Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.18 and 4.2.2.18)
Land Use and Recreation	*Land Use* On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use for housing would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Proposed construction on base would be consistent with base planning. The Alternate Runway Option would provide some benefits to circulation on base and preserve flexibility for future flightline development. No off-base residential land would be exposed to noise levels of 65 dB DNL or greater. The estimated additional military households would create a need for off-base residential development of between 208 to 416 acres. Available residential land was affected by the hurricane but could meet new development demands. *Recreation* Few impacts in local off-base recreational area (park) from noise similar or less than pre-hurricane levels. A small part of Shell Island within St Andrew State Park would be exposed to noise of 65 dB DNL. (Section 4.2.1.19)	*Land Use* On-base land use would be compatible with the base comprehensive plan. No off-base noise impacts on surrounding land use. Off-base land use for housing would be compatible with local planning and zoning. The estimated military households need off-base housing and could generate a need for residential development of between 208 to 416 acres. Limited supply of affordable homes in Santa Barbara North County could result in development of residential land in cities of Lompoc, Santa Maria, Guadalupe, and/or Buellton. *Recreation* No noise effects on off-base recreational areas or beaches. (Section 4.2.2.19)	*Land Use* No MQ-9–related impacts on land use under the No Action Alternative at Tyndall AFB or Vandenberg AFB. *Recreation* No MQ-9–related impact on recreation under the No Action Alternative at Tyndall AFB or Vandenberg AFB. (Sections 4.2.1.20 and 4.2.2.20)
Infrastructure	The capacity of Tyndall AFB's infrastructure, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would continue to operate below capacity and would not be affected by the slightly increased demand over current conditions. No significant impacts to infrastructure are anticipated. (Section 4.2.1.21)	The capacity of Vandenberg AFB's infrastructure, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would have adequate capacity for the increased demand. No significant impacts to infrastructure are anticipated. (Section 4.2.2.21)	The use of utilities and power and waste generation would remain at the affected environment levels, and there would be no MQ-9–related impacts to the infrastructure systems at Tyndall AFB and Vandenberg AFB. (Sections 4.2.1.22 and 4.2.2.22)

Table ES-2. Comparison of Alternatives for the Proposed MQ-9 Wing Beddown (Tyndall AFB or Vandenberg AFB)

Environmental Resource	MQ-9 Tyndall AFB Alternative	MQ-9 Vandenberg AFB Alternative	MQ-9 No Action Alternative
Transportation	The MQ-9 Main Runway Option would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue, particularly during the morning and afternoon peak periods. The intersection would operate at LOS F, below an acceptable LOS for highway facilities. Impacts would be significant. Delays at the intersection would be approximately 5 minutes and 1.5 minutes for the morning and afternoon peak periods, respectively. The MQ-9 Alternate Runway Option includes a new gate on US-98 to divert traffic from the main gate and lessen the impact at the main gate. Congestion on US-98 would be moderate, as it is the primary highway serving the base. (Section 4.2.1.23)	During afternoon peak hour, traffic conditions would be at unacceptable levels at the intersections of CA-1 and Lompoc Casmalia Road (LOS D) and Santa Lucia Canyon Road and Pine Canyon Road (LOS F). In addition, LOS D would occur at the intersection of CA-1 and Lompoc Casmalia Road during the morning peak period. Impacts to these two intersections and two road segments would be significant according to the Caltrans guidelines, which consider LOS D and below to be unacceptable. (Section 4.2.2.23)	No MQ-9–related construction or personnel increases would occur at either Tyndall AFB or Vandenberg AFB. At both bases, there would continue to be congestion but it would not be the result of any MQ-9 beddown. (Sections 4.2.1.24 and 4.2.2.24)
Socioeconomics	A total increase of 1,900 USAF personnel would occur at a rate of 475 personnel per year from 2022 through 2025. There would be a total of 2,584 dependents including 1,292 children. The estimated 950 school-age children would increase enrollment in Bay County schools by an estimated 238 students per year from 2022 through 2025. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 1,080 jobs, or approximately 270 jobs added per year from 2022 through 2025. Construction costs for MQ-9 facilities of $400 million would result in a total of direct, indirect, and induced jobs of approximately 985 jobs in 2021, rising to 1,675 in 2024. The MQ-9 Wing beddown would result in an estimated on-base and off-base increase in jobs of 985 in 2021, to 3,910 jobs in 2024, and then leveling off at approximately 2,980 jobs after 2025. There would be a USAF annual demand for approximately 417 off-base housing units, stabilizing at 1,589 additional units by 2025. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,837 housing units in the community for the years 2022 through 2025. When combined with the off-base USAF housing demand of 1,589 units, this would produce a total 2024 demand for 3,426 housing units. MQ-9 induced housing demand would drop back to a demand for 1,589 off-base units for USAF personnel plus units for 720 secondary personnel housing, for a total demand for 2,309 housing units after 2025. There would be a demand for additional public service personnel throughout Bay County. For example, there would be a demand for an additional 10 policemen, 7 firemen, and 11 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. (Section 4.2.1.25)	A total increase of 1,900 USAF personnel would occur at a rate of 475 personnel per year from 2022 through 2025. There would be 2,584 dependents including 1,292 children. The estimated 950 school-age children would increase enrollment in Santa Barbara County schools by an estimated 238 students per year from 2022 through 2025. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 760 jobs, or approximately 190 jobs added per year from 2022 through 2025. Construction costs for MQ-9 facilities of $400 million would result in a total of direct, indirect, and induced jobs of approximately 915 jobs in 2021, rising to 1,496 in 2022, and to 1,437 in 2024. The MQ-9 Wing would result in an estimated on-base and off-base increase in jobs of 915 in 2021, to 3,432 jobs in 2024, and then leveling off at approximately 2,660 jobs after 2025. There would be a USAF annual demand for approximately 417 off-base housing units, stabilizing at 1,589 additional units by 2025. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,338 housing units in the community by 2024. When combined with the demand for 1,589 USAF off-base housing units, this would result in a total demand of 2,587 units by the end of 2024. MQ-9 induced housing demand would drop back to a demand for 1,589 off-base units for USAF personnel plus 507 units for secondary personnel, for a total demand for 2,096 housing units after 2025. There would be a demand for additional public service personnel throughout Santa Barbara County. For example, there would be a demand for an additional 10 policemen, 7 firemen, and 11 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. (Section 4.2.2.25)	There would be no MQ-9 facilities construction, personnel changes, or flight operations. Socioeconomic conditions would be as described for the affected environment for Tyndall AFB and Vandenberg AFB. (Sections 4.2.1.26 and 4.2.2.26)
Environmental Justice	No off-base populations or noise-sensitive locations would be exposed to noise levels of 65 dB DNL or greater from MQ-9 aircraft operations at Tyndall AFB, and no off-base populations would be within the APZs. There would be no direct impacts to minority or low-income populations or children or elderly populations residing off base. Increased demand for off-base housing from USAF personnel, construction workers, and secondary workers in a market with a hurricane-reduced housing supply could amplify any adverse impacts on low-income residents since low-income residents typically spend a larger proportion of their income on housing than the general population. (Section 4.2.1.27)	No off-base populations or noise-sensitive locations would be exposed to noise levels of 65 dB CNEL or greater from MQ-9 aircraft operations at Vandenberg AFB and no off-base populations would be within the APZs. There would be no direct impacts to minority or low-income populations or children or elderly populations residing off base. Increased demand for off-base housing from USAF personnel, construction workers, and secondary workers in a tight housing market could amplify any adverse impacts on low-income residents since low-income residents typically spend a larger proportion of their income on housing than the general population. USAF policies that identify certain housing and commute distances as unacceptable reduce off-base demand for low-cost housing by USAF personnel. (Section 4.2.2.27)	There would be no disproportionate noise effect to minority or low-income populations as a result of the No Action Alternative. There are no residential land areas or populations impacted by noise levels of 65 dB CNEL associated with affected environment aircraft operations at either Tyndall AFB or Vandenberg AFB, and there would be no impacts to minority or low-income populations and no impacts on children or the elderly residing off base. (Sections 4.2.1.28 and 4.2.2.28)

Key: AFB = Air Force Base; AOC = areas of concern; APE = Area of Potential Effects; APZ = Accident Potential Zone; ATC = Air Traffic Control; BASH = bird/wildlife aircraft strike hazard; BMPs= best management practices; CA-1 = Cabrillo Highway; Caltrans = California Department of Transportation; CNEL = Community Noise Equivalent Level; COA = Certificate of Authorization; dB = decibels; DNL = day-night average sound level; ERP = Environmental Restoration Program; $L_{eq\text{-}8hr}$ = 8-hour equivalent noise level; LID = Low Impact Development; LOS = level of service; RPA = remotely piloted aircraft; US-98 = U.S. Highway 98; UAS = unmanned aircraft systems; USAF = U.S. Air Force

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ES.2.7 MITIGATION MEASURES

Mitigation measures avoid, minimize, remediate, or compensate for environmental impact. CEQ regulations (40 CFR 1508.20) define mitigation to include the following:

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

Avoiding, minimizing, or reducing potential beddown and operational impacts resulting from implementing the F-35A Wing at Tyndall AFB and, separately, the MQ-9 Wing at Tyndall AFB is a priority for the USAF. The mitigations described in Table ES-3 by applicable environmental resource will be evaluated and incorporated, as applicable, into a decision to beddown the F-35A Wing and the MQ-9 Wing to avoid, minimize, or reduce potential beddown and operational impacts. A variety of procedures and best management practices (BMPs) will be incorporated into the F-35A and MQ-9 beddowns in furtherance of 32 CFR 989.22 or to fulfill permit requirements, regardless of the location alternative. These mitigations include BMPs for construction practices and continuation of ongoing operational restrictions and avoidance measures. BMP mitigations are designed and incorporated into the contractual responsibilities for on-base projects and activities to increase safety and avoid or reduce the potential for environmental consequences. The USAF retains the responsibility to monitor projects and activities to ensure that these BMPs (Table ES-3) are applied. Since projects for both the proposed F-35A and MQ-9 beddowns involve construction in a wetland, a Finding of No Practicable Alternative will be included in the ROD for each Proposed Action.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Airspace Management and Air Traffic Control	
All Bases	MQ-9s will operate in existing SUA and maintain close contact with the FAA Air Route Traffic Control Centers (ARTCCs), ATC and other FAA entities to minimize conflicts with civil and commercial aviation.
Tyndall AFB	F-35A pilots will operate in existing SUA and maintain close contact with the FAA ARTCCs, ATC and other FAA entities to minimize conflicts with civil and commercial aviation.
Noise	
Vandenberg AFB	As a follow-up to this EIS, once the MQ-9 Wing beddown is complete and the full operational tempo of the squadron is in place, the USAF will confirm that the operational noise levels are within the noise impacts identified in this EIS in a new AICUZ. In addition, the USAF would continue to work closely with local communities to minimize noise impacts.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Tyndall AFB	As a follow-up to this EIS, once the F-35A Wing beddown is complete and the full operational tempo of the squadrons is in place, the USAF will confirm that the operational noise levels are within the noise impacts identified in this EIS in a new AICUZ study. As part of the AICUZ update, pilots would be consulted to either confirm or revise the operational data used in this Final EIS's noise modeling based on their first-hand knowledge. If noise levels calculated as part of the AICUZ update exceed those described in the Final EIS, then supplemental NEPA analysis and re-consideration of potential noise mitigation measures will be considered. In addition, the USAF would continue to work closely with local communities and Bay District Schools, Florida, to minimize noise impacts. Noise mitigation measures that were considered, and found to be not feasible at this time, are listed in Section 2.7.1 (Noise Mitigation Measures Considered and Found to not be Feasible at This Time).
Health and Safety	
All Bases	• Emergency and mishap response plans will be updated to address the needed procedures and response actions specific to the F-35A and or MQ-9 airframe. • Multiple AFIs address mishap notification, prevention, and investigation (see Appendix B.3.2).
Vandenberg AFB	Replace the current, ineffective electrobraid fence with a state-of-the-art deer exclusion fence to eliminate the potential for BASH.
Air Quality	
All Bases	Construction contractors will be required to implement the following BMPs to reduce fugitive dust emissions from exposed soils: • Construction personnel would minimize idling of all vehicles during construction. • Truckloads of dirt, sand, or gravel will be covered at all times. • Disturbed areas will be revegetated as soon as possible post construction. • Maintain all equipment to manufacturer specifications. • Employ fugitive dust control and soil retention practices including: o Use water spray trucks to keep all areas of vehicle movement damp enough to prevent dust from leaving the construction area. o Suspend all soil disturbance activities when visible dust plumes emanate from the site. o Minimize vehicle traffic on non-paved roads. o Designate personnel to monitor the dust control program and to order increased watering, as necessary, to prevent the transport of dust off-site. • Bases would incorporate Leadership in Energy and Environmental Design (LEED®) and sustainable development concepts to minimize air emissions during operations and achieve optimum resource efficiency and energy conservation, except to the extent limited or prohibited by law.
Tyndall AFB	The USAF will require construction to be consistent with the permitting requirements identified in the Florida State Clearinghouse comments on the Draft EIS (Appendix A).

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Hazardous Materials and Wastes	
All Bases	Hazardous Materials and Waste Management • Use the existing Hazardous Materials Pharmacy (HAZMART) for handling hazardous materials; dispose of all such materials in accordance with existing procedures. • If necessary, establish additional satellite accumulation areas for waste; manage in accordance with the installation hazardous waste management plan. Contamination Sites • Construction on an existing ERP site will follow USAF regulations. • As a BMP, prior to construction, workers will be educated on how to identify evidence of contamination, such as petroleum odors or soil staining.
Soils and Geologic Resources	
All Bases	• Use of reinforcement structures for any construction involving excavation to prevent collapse of excavated walls. • Frequently spray water on exposed soil during construction to keep soil from becoming airborne (especially with soils susceptible to wind erosion). • Use of biodegradable erosion control blankets on steeper slopes (greater than 50%). • New road construction or re-grading should employ measures including, but not limited to the following: o Stabilize areas of bare soil to reduce erosion (restore vegetative cover, mulch, and seed if possible) and o Install and or/maintain road erosion control devices. o Avoidance of uncoated steel and concrete being directly exposed to soils due to acidity and potential for corrosion. o Installation of sediment controls such as silt fencing, straw wattles, and drain inlet protection. • Proper soil stockpiling methods. • Revegetation of any disturbed areas as soon as possible.
Water Resources	
All Bases	• Implement National Pollutant Discharge Elimination System construction General Permit requirements. • Permit requirements include preparation and implementation of a Storm Water Pollution Prevention Plan and minimum BMPs such as those for erosion and sediment controls, materials management, waste management, and non-stormwater management. Revegetation is required meet to the permit's Notice of Termination conditions. • Implement Low Impact Development as required per Section 438 of the Energy Independence and Security Act (42 U.S.C. 17094).
Tyndall AFB	• Avoid wetlands during site design and construction as much as is feasible. • Prior to dewatering in or within 500 feet of an identified contaminated site (see Section 3.1.5.4), the groundwater would be tested; If groundwater does not meet disposal-to-surface-water criteria without treatment, the USAF will consult with the Florida Department of Environmental Protection to determine the proper permit and method to dispose of groundwater.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Vandenberg AFB	Prepare a Storm Water Control Plan per the Vandenberg AFB Post-Construction Storm Water Standards.
Biological Resources	
All Bases	• Avoid wetlands during site design and construction as much as is feasible • Implement mitigation contained in USFWS Biological Opinion. • Compensatory mitigation and federal permitting and state water quality certification, in accordance with Sections 401 and 404 of the CWA, would be necessary for any future construction activities affecting wetlands. • Implement mitigation contained in USACE/state agency Wetland Permit requirements.
Tyndall AFB	The FWC provided recommendations for mitigations to listed species (see Section 4.1.8, Biological Resources, F-35A at Tyndall). The recommendations are incorporated into the EIS by reference and are summarized below. For beach-nesting birds: • Conduct construction 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, and 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 and any cleared sites to ensure no active nests of ground nesting birds are present prior to the commencement of construction or demolition activities. If nesting is observed within or adjacent to a demolition or construction work site prior to or after the start of work, installation staff can coordinate with FWC staff to discuss nest buffers and other avoidance and minimization measures. For sea turtle lighting: • Tyndall AFB will develop an exterior lighting plan that specifies 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. For Florida black bear: • Continue to implement management objectives from the Tyndall AFB Integrated Natural Resources Management Plan. For Florida pine snake: • If a Florida pine snake is observed during construction, work activities will cease, and the snake will be allowed to leave with no support or hindrance. Sightings will be reported to the FWC.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Vandenberg AFB	The following measures would be implemented to avoid adverse effects to California least tern and western snowy plover: • Flight restrictions identified in the Programmatic Biological Opinion and Letter of Authorization will be incorporated into the Proposed Action to reduce noise effects on California least tern and western snowy plover. These actions include the following: o No construction or other ground-disturbing activities would occur within or near any known or potential California least tern or western snowy plover habitat. o Operation of the MQ-9 aircraft will adhere to existing programmatic flight restrictions to reduce noise effects (NOAA NMFS, 2019, p. 2; USFWS, 2015, pp. 14–15). These restrictions include the following: ▪ Except during takeoff and landing, RPA will not be flown below 1,000 feet over Purisima Point. ▪ Pilots will climb to 1,900 feet ASL over the Purisima Point area during the California least tern breeding season (typically April 15 to August 15). ▪ From March 1 through September 30 (which includes the breeding season for both birds): • Circling approaches to the southwest are prohibited unless flight safety dictates otherwise. • For air traffic approaching from the right to Runway 12, aircraft conducting rectangular/closed traffic patterns will delay base turn until near Purisima Point. • For air traffic approaching from the left to Runway 30, aircraft conducting rectangular/closed traffic patterns will execute a crosswind turn prior to the departure end of the runway. If unable to execute a crosswind turn prior to the departure end of the runway, then they will fly runway heading and climb to 1,900 feet MSL before turning crosswind. The following measures would be implemented to avoid adverse effects to the southern sea otter: • No construction or other ground-disturbing activities would occur within or near any known southern sea otter habitat. • Operation of the MQ-9 aircraft will adhere to existing programmatic flight restrictions to reduce noise effects (NOAA NMFS, 2019, p. 2; USFWS, 2015, pp. 14-15). These restrictions include: o Except during takeoff and landing, RPA will not be flown below 1,000 feet over Purisima Point. o From March 1 through September 30: ▪ Pilots will climb to 1,900 feet ASL over the Purisima Point area. ▪ Circling approaches to the southwest are prohibited unless flight safety dictates otherwise. ▪ For air traffic approaching from the right to Runway 12, aircraft conducting rectangular/closed traffic patterns will delay base turn until near Purisima Point. ▪ For air traffic approaching from the left to Runway 30, aircraft conducting rectangular/closed traffic patterns will execute a crosswind turn prior to the

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Vandenberg AFB (continued)	departure end of the runway. If unable to execute a crosswind turn prior to the departure end of the runway, aircraft will fly runway heading and climb to 1,900 feet MSL before turning crosswind. The following measures would be implemented to avoid adverse effects to the California red-legged frog: • Project construction activities, primarily habitat removal, shall occur during the dry season to the maximum extent feasible. • Prior to conducting construction activities, a USFWS-approved biologist will conduct daily surveys of the active project site if potential suitable California red-legged frog habitat is present, prior to the initiation of work, and relocate all life stages of California red-legged frogs found within suitable habitat in the proposed project sites to the nearest suitable habitat outside of the area but within the same watershed. • Equipment maintenance and refueling will be conducted at least 250 feet (76 meters) away from riparian habitats and wetlands. • A qualified biological monitor will conduct pre-project training for all workers. At a minimum, the training would include a description of the listed species occurring in the area, and the general and specific measures and restrictions to protect these species during project implementation. • If two adult, two subadult, or two juvenile California red-legged frogs are found dead or wounded or if five adult, five subadult, or five juvenile California red-legged frogs are captured and relocated during construction of the MQ-9 beddown project, the USAF must contact USFWS immediately to reinitiate formal consultation. Project activities that are likely to cause additional take should cease as the exemption provided pursuant to section 7(o)(2) may lapse and any further take could be a violation of section 4(d) or 9. The Air Force must notify the USFWS within three days of finding an injured or dead California red-legged frog. • California red-legged frogs must be relocated from all areas where project activities would occur near riparian or aquatic habitat and that may result in injury or mortality of these individuals. California red-legged frogs may only be captured by hand or dip net and transported in buckets separate from other species. When capturing and removing California red-legged frogs, the USFWS-approved biologist(s) must minimize the amount of time that animals are held in captivity. To further reduce the time a California red-legged frog is in captivity, the USAF must identify an area to relocate individuals (receiver site) prior to surveys. California red-legged frogs must be maintained in a manner that does not expose them to temperatures or any other environmental conditions that could cause injury or undue stress. • To avoid transferring disease or pathogens between aquatic habitats during the course of surveys and handling of California red-legged frogs, the USFWS-approved biologist(s) must follow the Declining Amphibian Population Task Force's Code of Practice. A bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) may be substituted for the ethanol solution. Care must be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat. The following measures would be implemented to avoid adverse effects to vernal pool fairy shrimp: • Project construction activities, primarily habitat removal, will occur during the dry season to the maximum extent possible.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Vandenberg AFB (continued)	• Equipment maintenance and refueling will be conducted at least 250 feet away from riparian habitats and wetlands. • A qualified biological monitor will conduct pre-project training for all workers. At a minimum, the training would include a description of the listed species occurring in the area, and the general and specific measures and restrictions to protect these species during project implementation • Mapped vernal pool fairy shrimp potential habitat and features will be avoided to the extent possible, particularly those within the disturbance boundary but outside of the permanent construction footprint. Sedimentation and downstream contaminant control of pools in the vicinity of proposed construction will also be implemented using drift fences and possibly small sandbag barriers to block potentially contaminated runoff from a potential pool. • To assess opportunities for future enhancement, the USAF identified 33 unoccupied pools, primarily in areas south and southwest of the airfield and prioritized/ranked the pools based on their potential for restoration and to function as suitable habitat for vernal pool fairy shrimp. Based on this previous effort, the USAF will prepare and submit a mitigation and enhancement plan to USFWS including, but not limited to, a description of the proposed enhancement activities, identification of success criteria, and a monitoring plan to ensure objectives are met. The plan will prioritize higher-ranked pools for enhancement. Other general planning considerations at Vandenberg AFB will be considered when determining the prioritization of pools considered for enhancement. • As part of the mitigation and enhancement plan, proposed loss of mapped vernal pool fairy shrimp habitat associated with the Maintenance Complex (approximately 5.87 acres), defined as "mowed/managed," will be restored at a ratio of 3:1 (habitat enhanced:habitat affected). The remainder of mapped vernal pool fairy shrimp habitat (not including "mowed/managed," approximately 0.86 acre) will be restored at a 1:1 ratio (habitat enhanced:habitat affected). The following are examples of potential mitigation for Lompoc yerba santa: • Continue the process of consultation with the USFWS. • To avoid or minimize impacts to Lompoc yerba santa localities along the southern project border, the USAF will install and maintain a 100-foot buffer fence around plant occurrences. • A qualified biological monitor will conduct pre-project training for all workers. At a minimum, the training would include a description of the listed species occurring in the area and the general and specific measures and restrictions to protect these species during project implementation. • The USAF will update the current Lompoc Yerba Santa Workplan to include additional future enhancement and restoration at the 35th Street Lompoc yerba santa population site and will: o Establish a mitigation/restoration program utilizing past restoration planning (MSRS, 2012) as a basis and incorporating information collected from the Maintenance Complex site. o Offset impacts to occupied habitat through enhancement (primarily invasive species removal) of the existing population at the 35th Street location at a 3:1 ratio (habitat enhanced: habitat affected). Locations on the remaining 37.40 acres at Vandenberg AFB may be incorporated into mitigation and restoration planning in coordination with USFWS.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Vandenberg AFB (continued)	• For all unavoidable occupied habitat removal, include an evaluation of known localities and incorporate information from the recent Santa Barbara Botanic Garden Lompoc Yerba Santa Genetics Program. Seeds and samples of vegetative cuttings were gathered from Lompoc yerba santa within the proposed Maintenance Complex site and will be included in the propagation, outplanting, and maintenance program on Vandenberg AFB. • Occupied habitat will be enhanced by invasive species removal (habitat enhanced: habitat affected) or other restoration activities (i.e., removing invasive plant species at a 3:1 ratio or other ratio approved in coordination with the USFWS). Other locations on Vandenberg may be incorporated into mitigation and restoration planning in coordination with the USFWS. OTHER MEASURES: • The USAF will follow reporting and notification requirements as indicated in the Biological Opinion (see Appendix A): o The USAF must request USFWS approval of any biologist who will conduct activities related to this Biological Opinion at least 30 days prior to any such activities. A qualified biologist(s) is more likely to reduce adverse effects based on their expertise with the covered species. Please be advised that possession of a 10(a)(1)(A) permit for the covered species does not substitute for the implementation of this measure. Authorization of USFWS-approved biologists is valid for this consultation only. • As feasible, the USAF will follow recommendations provided in the Biological Opinion.
Cultural Resources	
All Bases	In the case of unanticipated or inadvertent cultural resource discoveries, the USAF would comply with Section 106 of the NHPA and follow the standard operating procedures outlined in the Integrated Cultural Resources Management Plan.
Vandenberg AFB	The Santa Inez Band of Chumash Indians will be afforded the opportunity to monitor vegetation clearing in any and all project areas where vegetation clearing would occur, should the Tribe be interested in doing so.
Land Use and Recreation	
All Bases	Once the full complement of aircraft are operating at the selected base, prepare an update to the current AICUZ Study to validate operational data and identify projected noise levels based on the most recent noise data.
Infrastructure	
All Bases	Incorporate Leadership in Energy and Environmental Design (LEED®) and sustainable development concepts into construction projects to achieve optimum resource efficiency, sustainability, and energy conservation, except to the extent limited or prohibited by law.
Transportation	
Tyndall AFB	Low-cost traffic engineering improvements such as modified lane configurations (double right turn lane from Tyndall Drive, extended right turn lane to Airey Avenue from US-98), improved signal timing and phasing, off-peak scheduled construction trips, on-site concrete batch plant for F-35A apron construction activities.

Table ES-3. Mitigations

Resource Area/Alternative	Mitigations
Vandenberg AFB	Optimized signal timing at intersections, signal warrant analysis to determine need for future upgrade of intersection, off-peak construction trips, low-cost traffic engineering improvements such as lane configuration and intersection pavement markings and signs (including raised splitter island on CA-1 at Santa Lucia Canyon Road for safety of left turn movements).
Socioeconomics	
Tyndall AFB	Continue to work with Bay County communities to reduce impacts to housing and community services from base clean up and new construction.
Vandenberg AFB	No base-specific mitigation measures identified.
Environmental Justice	
All Bases	No base-specific mitigation measures identified.

Key: ACC = Air Combat Command; AFB = Air Force Base; AFI = Air Force Instruction; AICUZ = Air Installations Compatible Use Zones; ARTCC = Air Route Traffic Control Center; ASL = above sea level; ATC = Air Traffic Control; BASH = bird/wildlife aircraft strike hazard; BMP = best management practice; EIS = Environmental Impact Statement; ERP = Environmental Restoration Program; FAA = Federal Aviation Administration; HAZMART = Hazardous Materials Pharmacy; LEED® = Leadership in Energy and Environmental Design; MSL = mean sea level; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act; RPA = remotely piloted aircraft; SPCCP = Spill Prevention, Control, and Countermeasures Plan; SUA = Special Use Airspace; USAF = U.S. Air Force; U.S.C. = United States Code; USFWS = U.S. Fish and Wildlife Service

ES.3. ENVIRONMENTAL CONSEQUENCES

The environmental consequences contained in this section of the Executive Summary are summarized from the EIS Chapter 4. These summarized environmental consequences are those identified in the comparison in Table ES-1 and Table ES-2.

ES.3.1 F-35A WING BEDDOWN ALTERNATIVES AT TYNDALL AFB (THREE-SQUADRON OR FOUR-SQUADRON F-35A WING BEDDOWN)

ES.3.1.1 Airspace Management and Air Traffic Control

Three-Squadron F-35A Wing Alternative. There would be no significant impacts to airfield operations or training airspace. A three-squadron F-35A Wing beddown would conduct an estimated 12,300 sorties, which would generate an estimated 33,440 airfield operations. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB.

Four-Squadron F-35A Wing Alternative. No significant impacts to airfield operations or training airspace. A four-squadron F-35A Wing beddown would conduct 16,400 sorties, which would generate an estimated 44,600 airfield operations. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB.

ES.3.1.2 Noise

Three-Squadron F-35A Wing Alternative. The number of off-base acres of land exposed to noise levels greater than 65 dB DNL would increase from 2 acres to as many as 68 acres, and the number of people exposed would increase from 0 to as many as 80 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, there were 217 off-base acres of land and an estimated 190 people exposed to noise levels greater than 65 dB DNL.

Compared to the No Action Alternative (with no active F-22 mission), proposed F-35A operations would result in increased levels at noise-sensitive locations by as much as 14 dB DNL under any of the afterburner take-off scenarios. Noise levels at Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to greater than 65 dB, 70 dB, and 80 dB, respectively, under any afterburner scenario and would result in the same incompatible land uses under pre-hurricane conditions based on DoD guidelines. The DNL at representative noise-sensitive locations would be uniformly lower with the F-35A operations than noise levels under pre-hurricane conditions.

Average daytime outdoor speech-interference events would increase from two events per hour to as many as seven events per hour (under any afterburner scenario). To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions.

The F-35A operations would result in noise levels at Tyndall Elementary School exceeding criteria for classrooms, with exterior school-day noise levels as loud as 75 dB 8-hour equivalent noise level ($L_{eq\text{-}8hr}$). The number of events per average hour with potential to interfere with speech with windows open would increase by as many as five to six events per average hour and up to four to five events with windows closed. To put this effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Noise levels at Parker Elementary School would remain below classroom criteria under all afterburner usage scenarios.

The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent, compared with 1 percent under the No Action Alternative. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions.

Risk of potential hearing loss, workplace noise impacts, or nonauditory health impacts would remain minimal under all afterburner-usage scenarios.

The noise level beneath overland training airspace would increase to as much as 48 dB L_{dnmr} (3 dB increase). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. The number of sonic booms in warning areas would decrease with F-35A operations compared with pre-hurricane F-22 flights. (See EIS Section 4.1.2.1.)

Four-Squadron F-35A Wing Alternative. The number of off-base acres of land exposed to noise levels greater than 65 dB DNL would increase from 2 acres to as many as 93 acres, and the number of people exposed would increase from 0 to as many as 135 when compared with the No Action

Alternative with no active F-22 mission. For context, prior to Hurricane Michael, there were 217 off-base acres of land and an estimated 190 people exposed to noise levels greater than 65 dB DNL.

Compared with the No Action Alternative with no active F-22 mission, proposed F-35A operations would result in levels at noise-sensitive locations increasing as much as 15 dB DNL under any of the afterburner take-off scenarios. Noise levels at Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to greater than 70 dB, 70 dB, and 80 dB, respectively, and would result in the same incompatible land uses under pre-hurricane conditions based on DoD guidelines. The DNL noise levels at representative noise-sensitive locations would be uniformly lower with the F-35A operations than noise levels under pre-hurricane conditions.

Average daily outdoor speech-interference events would increase from 2 events to as many as 9 to 11 events per average hour (under any afterburner scenario) when compared with the No Action Alternative. To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions.

Noise levels at Tyndall Elementary School would exceed classroom criteria, with exterior school-day noise levels of up to 76 dB $L_{eq\text{-}8hr}$. Events with potential to interfere with speech would increase from one under the No Action Alternative to as many as six events per average hour, with windows open or closed. To put the effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Levels at Parker Elementary School would remain below classroom noise-level criteria under all afterburner scenarios.

The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent compared with 1 percent under the No Action Alternative. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions.

Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal under all afterburner-usage scenarios.

The noise level beneath overland training airspace proposed for regular use would increase by as much as 4 dB (up to 49 dB L_{dnmr}). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. Numbers of sonic booms in warning areas would decrease with F-35A flights as compared with F-22 flights before the hurricane. (See EIS Section 4.1.2.2.)

ES.3.1.3 Health and Safety

Three-Squadron F-35A Wing Alternative. No significant impacts would occur. Initiation of F-35A flight operations compared with 17,000 annual flight operations under the No Action Alternative would result in an increase from approximately 6 to an estimated 17 bird/wildlife-aircraft strike hazard (BASH) incidents per year. BASH incidents would be comparable to the average of 20 incidents per year prior to 2018. Based on the projected Class A mishap rate, the three-squadron Wing would have an estimated annual average of 0.43 Class A mishaps training over water and 0.14 Class A mishaps over land. Training and construction activities would be

conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible. (See EIS Section 4.1.3.1.)

Four-Squadron F-35A Wing Alternative. No significant impacts would occur. Initiation of F-35A flight operations would result in an increase from approximately 6 to an estimated 20 BASH incidents per year, the same as the average prior to 2018. Based on the projected Class A mishap rate, the four-squadron Wing would have an estimated annual average of 0.57 Class A mishaps training over water and 0.19 Class A mishaps over land. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible.

ES.3.1.4 Air Quality

Three-Squadron F-35A Wing Alternative. Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality.

Annual operational emissions of volatile organic compounds (VOCs), sulfur oxides (SO_x), particulate matter less than or equal to 10 microns in diameter (PM_{10}), nitrogen oxides (NO_x), and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of carbon monoxide (CO) would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 0.8 percent change (increase) in the total CO emissions generated within Bay County in 2017 and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions. Emissions sources would operate in compliance with applicable Florida Department of Environmental Protection (FDEP) air quality regulations, emission limitations, and permitting requirements.

Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality.

Four-Squadron F-35A Wing Alternative. Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality.

Annual operational emissions of VOCs, SO_x, PM_{10}, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO and NO_x would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 1.1 and 3.5 percent change (increase) in the total CO and NO_x emissions generated within Bay County in 2017, respectively, and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO and NO_x emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions. Sources would operate in compliance with applicable FDEP air quality regulations, emission limitations, and permitting requirements. Flight

operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality.

ES.3.1.5 Hazardous Materials and Waste

Three-Squadron F-35A Wing Alternative. Minor hazardous materials and waste would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations. If soil contamination is present at the construction site, a permit for remediation may be required by the State and notification requirements to inform the FDEP would be met prior to the removal or disturbance of any potentially affected soils. Should soils need to be removed, transported, treated, and/or disposed, Resource Conservation and Recovery Act regulations would apply to the characterization, transportation, and disposal of this material.

Four-Squadron F-35A Wing Alternative. Hazardous materials and wastes for the Four-Squadron Wing Alternative would be as described for the Three-Squadron Wing Alternative.

ES.3.1.6 Soils and Geologic Resources

Three-Squadron F-35A Wing Alternative. Up to 130.3 acres of previously disturbed land could be temporarily disturbed due to construction of 26.2 acres of base facilities. Implementing standard construction practices in accordance with a National Pollutant Discharge Elimination System (NPDES) Construction General Stormwater Permit, the Stormwater Pollution Prevention Plan (SWPPP), and other BMPs would result in no significant impacts occurring.

Four-Squadron F-35A Wing Alternative. Up to 130.3 acres of previously disturbed land could be temporarily disturbed due to construction of approximately 26 acres of base facilities. Implementing standard construction practices in accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring.

ES.3.1.7 Water Resources

Three-Squadron F-35A Wing Alternative. There would be no significant impacts to water resources. BMPs to control erosion and pollution during construction would minimize impacts to water resources resulting from constructing 0 to 23 acres of new impervious surfaces, depending on facility siting. If dewatering is required in or within 500 feet of an identified contaminated site (see EIS Section 3.1.5.4), the groundwater would be tested/characterized prior to dewatering to surface waters. If groundwater does not meet disposal-to-surface-water criteria without treatment, the USAF would consult with the FDEP to determine the proper permit and method to dispose of groundwater. Low Impact Development (LID) in facility design (mandatory for facilities greater than 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program.

Four-Squadron F-35A Wing Alternative. There would be no significant impacts to water resources. BMPs to control erosion and pollution during construction would minimize impacts to water resources resulting from constructing 0 to 28 acres of new impervious surfaces, depending on facility siting. LID in facility design, dewatering, and construction would be as described for the Three-Squadron Wing Alternative.

ES.3.1.8 Biological Resources

Three-Squadron F-35A Wing Alternative. Construction of facilities would result in the loss of up to 8.5 acres of vegetation/wildlife habitat and loss of up to 3.3 acres of wetlands. In a letter dated August 3, 2020, consultation with the USFWS Panama City Field Office concluded with their concurrence with the USAF determination of *No Effect* to threatened and endangered species at Tyndall AFB.

Four-Squadron F-35A Wing Alternative. Construction of facilities would result in the loss of up to 8.5 acres of vegetation/wildlife habitat and loss of up to 3.3 acres of wetlands. Impacts to federally listed species would be as described for the Three-Squadron Wing Alternative.

ES.3.1.9 Cultural Resources

Three-Squadron F-35A Wing Alternative. There are no historic properties in the area of potential effects (APE) for direct impacts. There would be no adverse effect to NRHP-listed or -eligible resources. In a letter dated July 29, 2020, the Florida SHPO concurred with the USAF determination that the proposed F-35A Wing and MQ-9 Wing beddown undertakings will have no effect to historic properties listed or eligible for listing in the NRHP.

Four-Squadron F-35A Wing Alternative. Effects would be the same as the three-squadron F-35A beddown alternative. There would be no adverse effect to NRHP-listed or -eligible resources.

ES.3.1.10 Land Use and Recreation

Three-Squadron F-35A Wing Alternative. On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 61 and 68 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 10 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This is less acreage than had been exposed to comparable noise levels before the hurricane. No land use effects from small differences in off-base noise from variations in modeled afterburner use. The USAF is working closely with the off-base communities to provide information that can be used for community land use planning decisions.

Additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane but could meet new development demands.

Few impacts are anticipated in local off-base recreational areas (e.g., parks) from noise similar to, or less than, pre-hurricane levels. A small part of Shell Island within St. Andrew State Park would be exposed to noise of 65 dB DNL.

Four-Squadron F-35A Wing Alternative. On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 84 and 93 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 18 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This is fewer acres than before the hurricane. There would be no land use effects from small differences in off-base noise from variations in modeled afterburner use. The USAF is working closely with the off-base communities to provide information that can be used for community land use planning decisions.

Additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane, and demand could increase the strain on local resources in the midst of ongoing hurricane recovery.

Some residents living in areas underlying training airspace or long-term visitors to the Mud Swamp Wilderness Area could be annoyed by additional overflights and associated noise.

ES.3.1.11 Infrastructure

Three-Squadron F-35A Wing Alternative. There would be no significant impacts to the base infrastructure associated with the F-35A Wing following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions.

Four-Squadron F-35A Wing Alternative. There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions.

ES.3.1.12 Transportation

Three-Squadron F-35A Wing Alternative. Additional traffic at the intersection of U.S. Highway 98 (US-98), Tyndall Drive, and Airey Avenue, particularly during the morning and afternoon peak periods, would result in a level of service (LOS) F. The intersection would experience significant impacts, up to 10 minutes of delay, from morning right turns onto Airey Avenue and evening left turns onto US-98.

A segment of US-98 would exceed capacity (LOS F) during the morning peak period and would be at capacity (LOS E) during the afternoon peak period.

Four-Squadron F-35A Wing Alternative. Additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue, as well as along US-98, would result in LOS F at the intersection and

along US-98 during morning and afternoon peak periods. Delays would be significant under this alternative (over 11 minutes of control delay at the intersection), with twice as much traffic volume as highway capacity could support.

ES.3.1.13 Socioeconomics

Three-Squadron F-35A Wing Alternative. A total increase of 2,200 USAF personnel would occur at a rate of 550 personnel per year from 2022 through 2025. There would be a total of 2,992 dependents including 1,496 children. The estimated 1,100 school-age children would increase enrollment in Bay County schools by an estimated 275 students per year from 2022 through 2025. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 1,206 jobs, or approximately 302 jobs added per year from 2022 through 2025.

Construction costs for F-35A facilities of $320 million would result in a total of direct, indirect, and induced jobs of approximately 657 jobs in 2021, rising to 1,288 to 1,239 jobs from 2022 through 2024. This alternative would result in an estimated on-base and off-base increase in jobs of 657 in 2021, to 2,140 in 2022, increasing to 3,795 jobs in 2024, peaking at 5,008 jobs in 2025, and then declining and leveling off at approximately 3,406 jobs after 2025.

There would be an annual demand for USAF off-base housing, stabilizing at 2,019 additional units by 2025. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,630 housing units in the community for the years 2022 through 2025. Adding that to the 2,019 USAF off-base housing demand would result in a total demand of 3,649 units by the end of 2024.

Housing demand would be reduced to represent total housing demand for 2,019 off-base USAF personnel plus 804 secondary personnel, for a demand for 2,823 housing units after 2025.

There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 11 policemen, 8 firemen, and 14 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of personnel needed during construction. The public service and education personnel would add to the demand for housing.

Four-Squadron F-35A Wing Alternative. A total increase of 2,933 USAF personnel would occur at a rate of 587 personnel per year from 2022 through 2026. There would be a total of 3,988 dependents including 1,994 children. The estimated 1,466 school-age children would increase enrollment in Bay County schools by an estimated 293 students per year from 2022 through 2026. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 1,609 jobs, or approximately 322 jobs added per year from 2022 through 2026.

Construction costs for F-35A facilities of $400 million would result in a total of direct, indirect, and induced jobs of approximately 1,314 jobs in 2021, declining to 1,191 jobs in 2025 before completing construction.

This alternative would result in an estimated on-base and off-base increase in jobs of 1,314 in 2021, to 3,966 in 2024, and then leveling off at approximately 4,542 jobs from 2026 and onward.

There would be an annual demand for USAF off-base housing, stabilizing at 2,690 additional units by 2026. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,899 housing units in the community for the years 2022 through 2025. Adding this to the 2025 USAF off-base housing demand of 2,690 would result in a total demand of 4,589 units by the end of 2024.

Housing demand would be reduced to represent a secondary employee demand for 1,073 plus the USAF demand for 2,690 housing units, for a total off-base demand for 3,763 housing units from 2026 and onward.

There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 15 policemen, 11 firemen, and 18 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. The public service and education personnel would add to the demand for housing.

ES.3.1.14 Environmental Justice

Three-Squadron F-35A Wing Alternative. The percent of minority and low-income populations in the census block group, defined as the region of influence (ROI), does not exceed the percent of minority and low-income populations in the census tract, defined as the Community of Comparison (COC). There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise.

The increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected.

There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction.

No populations reside within the Accident Potential Zones (APZs). The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions. (See EIS Section 4.1.14.1.)

Four-Squadron F-35A Wing Alternative. The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise.

The increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected.

There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction.

No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions.

ES.3.1.15 No Action Alternative for the Proposed F-35A Wing Beddown

Under the No Action Alternative for the proposed F-35A Wing beddown, there would be no F-35A beddown at Tyndall AFB and no impacts to the natural and human environment would result from an F-35A Wing beddown. Should the USAF independently decide on the No Action Alternative for the MQ-9 Wing beddown at Tyndall AFB, environmental conditions at Tyndall AFB would be as described in EIS Section 3.1. Should the USAF independently decide to beddown the MQ-9 Wing at Tyndall AFB, environmental conditions under the No Action Alternative for the Proposed F-35A Wing beddown would be as described in EIS Section 4.2.1.

ES.3.2 MQ-9 WING BEDDOWN AT TYNDALL AFB OR VANDENBERG AFB

ES.3.2.1 Airspace Management and Air Traffic Control

MQ-9 Wing Beddown at Tyndall AFB Alternative. No significant impacts to airfield operations or training airspace. An MQ-9 Wing at Tyndall AFB would generate an estimated 5,700 airfield operations plus any additional practice takeoffs/landings and 2,820 sortie operations in the training airspace and required COAs. The conduct of these operations in any airspace environment would adhere to the strict unmanned aircraft system (UAS) requirements governing these flights. This includes the manner in which Air Traffic Control (ATC) and RPA operators must closely monitor and control these flights throughout all flight activities. Tyndall AFB has the airfield and airspace capabilities for supporting the MQ-9 Wing beddown and its operational requirements without impacting other manned aircraft operations and airspace uses.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. No significant impacts to airfield operations or training airspace. An MQ-9 Wing at Vandenberg AFB would generate an estimated 5,700 airfield operations plus any additional practice takeoffs/landings and 2,820 sortie operations in the training airspace and required COAs. The conduct of these operations in any airspace environment would adhere to the strict UAS requirements governing these flights. This includes the manner in which ATC and RPA operators must closely monitor and control these flights throughout all flight activities. Vandenberg AFB has the airfield and airspace capabilities for supporting the MQ-9 beddown and its operational requirements without impacting other manned aircraft operations and airspace uses.

ES.3.2.2 Noise

MQ-9 Wing Beddown at Tyndall AFB Alternative. Noise levels exceeding 65 dB DNL would not extend off base. MQ-9 overflights under the Main Runway or Alternate Runway Option would increase the number of outdoor noise events, with potential to interfere with speech momentarily, by up to three events per hour at the locations studied relative to the No Action Alternative with minimal flying operations. Noise levels at Tyndall Elementary School would remain above the recommended maximum noise level, and noise at Parker Elementary School would remain below criteria levels under both options. The number of events per hour at Tyndall Elementary School with potential to interfere with speech would be two with windows open or closed under the Main Runway Option and one under the Alternate Runway Option.

The probability of people being awakened at least once per night by MQ-9 operations at the Tyndall AFB Dormitories and residential areas in the vicinity of Tyndall Elementary School would increase from 0 to 1 percent under the Main Runway Option and would remain near 0 percent at all locations under the Alternate Runway Option.

Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal.

MQ-9 operations at mission altitude are below typical ambient noise levels and do not add to overall subsonic-aircraft-operations noise levels beneath overland training airspace.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. Noise levels exceeding 65 dB CNEL (Community Noise Equivalent Level, the equivalent of DNL in California) would not extend off base. Noise levels at representative noise-sensitive locations near Vandenberg AFB would increase by as much as 2 dB to 48 dB (similar to 45-dB noise levels typical in rural areas). MQ-9 overflights would increase the number of outdoor noise events, with potential to interfere with speech momentarily, by up to three events per hour at the locations studied. Outdoor noise levels at Crestview Elementary School and Maple High School would remain below 60 dB $L_{eq\text{-}8hr}$ under the Proposed Action.

The probability of sleep disturbance at the representative noise-sensitive locations would continue near zero. Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal.

MQ-9 operations at mission altitude are below typical ambient noise levels and do not add to overall subsonic-aircraft-operations noise levels beneath overland training airspace.

ES.3.2.3 Health and Safety

MQ-9 Wing Beddown at Tyndall AFB Alternative. There is a potential increase of BASH events with additional flight operations. The 5,900 MQ-9 flight operations would be calculated to result in 2 additional BASH incidents per year. There are approximately 6 BASH incidents per year with No Action. There could be one calculated Class A incident every 1.2 years. There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft ("lost-link"). The aircraft is programmed to return to the vicinity of the base so that direct line-of-sight

communication can be restored. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., low public presence) would minimize any impacts. All planned training and construction activities would be accomplished by technically qualified personnel and conducted in accordance with applicable USAF, state, and federal safety standards and requirements. No significant impacts would be anticipated.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. There is potential increase of BASH events with additional flight operations. The 5,900 MQ-9 flight operations would be calculated to result in fewer than 2 additional BASH incidents per year. Animals and birds would become accustomed to increased airfield operations by a relatively slow aircraft and would be able to avoid the MQ-9. There could be one calculated Class A incident every 1.2 years. There is an average of fewer than 2 BASH incidents per year with No Action. There would be one calculated Class A incident every 1.2 years. There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft ("lost-link"). The aircraft is programmed to return to the vicinity of the base so that direct line-of-sight communication can be restored. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., low public presence) would minimize any impacts. All planned training and construction activities would be accomplished by technically qualified personnel and conducted in accordance with applicable USAF, state, and federal safety standards and requirements. No significant impacts would be anticipated.

ES.3.2.4 Air Quality

MQ-9 Wing Beddown at Tyndall AFB Alternative. Total annual construction and operational emissions would be below all initial indicators of potential significance. Emissions sources would operate in compliance with applicable FDEP air quality regulations, emission limitations, and permitting requirements. This alternative would not result in any significant impacts to air quality.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. Impacts to air quality for the Four-Squadron Wing Alternative would be as described for the Three-Squadron Wing Alternative.

ES.3.2.5 Hazardous Materials and Waste

MQ-9 Wing Beddown at Tyndall AFB Alternative. Minor hazardous materials and wastes would be generated from demolition, construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple Environmental Restoration Program (ERP) sites would follow USAF regulations.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. Minor hazardous materials and wastes would be generated from demolition, construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within ERP Site AOC-147 would follow USAF regulations.

ES.3.2.6 Soils and Geologic Resources

MQ-9 Wing Beddown at Tyndall AFB Alternative. Up to 120.7 (Maintenance Complex Option 1) or 678.9 (Maintenance Complex Option 2) acres could be temporarily disturbed due to construction. Facility footprints within the disturbed areas total approximately 23 acres for either option. Implementing standard construction practices would result in no significant impacts to soils or geologic resources.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. Potential construction impacts include the disturbance of at least 50 acres and creation of approximately 21 acres of impervious surfaces. Implementing standard construction practices would result in no significant impacts to soils or geologic resources.

ES.3.2.7 Water Resources

MQ-9 Wing Beddown at Tyndall AFB Alternative. Runoff could come from up to 120.7 (Maintenance Complex Option 1) or 678.9 (Maintenance Complex Option 2) acres that could be temporarily disturbed due to construction. Facility footprints within the disturbed areas total approximately 23 acres for either option. The incorporation of BMPs to control erosion and pollution during construction would reduce impacts to water resources. The incorporation of LID in facility design (mandatory for facilities over 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. There would be no significant impacts to water resources. This alternative would be consistent with the enforceable policies of Florida's Coastal Management Program.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. Construction would result in the loss of 10 to 15 acres of wetlands and the addition of 25 acres of new impervious surfaces. The incorporation of BMPs to control erosion and pollution during construction would reduce impacts to water resources. The incorporation of LID in facility design (mandatory for facilities over 5,000 square feet) would maintain pre-development hydrology to the greatest extent practicable. There would be no significant impacts anticipated to water resources. There would be no effects to California coastal uses or resources.

ES.3.2.8 Biological Resources

MQ-9 Wing Beddown at Tyndall AFB Alternative. Construction of facilities would result in the loss of up to 25 acres of vegetation/wildlife habitat and loss of up to 8.1 acres of wetlands under Maintenance Complex Option 1. In a letter dated August 3, 2020, consultation with the USFWS Panama City Field Office concluded with their concurrence with the USAF determination of *No Effect* to threatened and endangered species at Tyndall AFB.

Construction under Maintenance Complex Option 2 would result in the loss of up to 621 acres of vegetation/wildlife habitat and up to 303.4 acres of wetlands. In a letter dated August 3, 2020, consultation with the USFWS Panama City Field Office concluded with their concurrence with the USAF determination of *not likely to adversely affect* threatened and endangered species at Tyndall AFB. Flight operations are not expected to impact any sensitive species.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. Facility construction would result in impacts to biological resources primarily in the Maintenance Complex construction area, resulting in loss of up to 52.3 acres of vegetation/wildlife habitat. No impacts to federally jurisdictional wetlands would occur. A determination of "may affect, not likely to adversely affect" has been made for three federally listed species (Southern sea otter, California least tern, Western snowy plover) and a determination of "may affect, likely to adversely affect" has been made for an additional three species (California red legged frog, vernal pool fairy shrimp, Lompoc yerba santa; EIS Section 4.2.2.15). On September 21, 2020, the USFWS Ventura office issued a Biological Opinion concurring with these determinations (EIS Appendix A). Flight operations would adhere to minimum altitude overflight of sensitive marine or avian species. With adherence to the mitigation measures issued in the Biological Opinion and adopted in the EIS (see Table ES-3), overflights are not expected to impact any sensitive species.

ES.3.2.9 Cultural Resources

MQ-9 Wing Beddown at Tyndall AFB Alternative. There are no historic properties in the APE for direct effects. There would be no adverse effect to historic properties. In a letter dated July 29, 2020, the Florida SHPO concurred with the USAF determination that the proposed F-35A Wing and MQ-9 Wing beddown undertakings will have no effect to historic properties listed or eligible for listing in the NRHP.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. There are no known historic properties in the APE. There would be no adverse effect to historic properties. In a letter dated June 3, 2020, the California SHPO closed the consultation until and unless Vandenberg AFB is selected as the MQ-9 beddown location (see EIS Appendix A).

ES.3.2.10 Land Use and Recreation

MQ-9 Wing Beddown at Tyndall AFB Alternative. On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use for housing would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Proposed construction on base would be consistent with base planning. The Alternate Runway Option would provide some benefits to circulation on base and preserve flexibility for future flightline development.

No off-base residential land would be exposed to noise levels of 65 dB DNL or greater. The additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane but could meet new development demands.

Few impacts in local off-base recreational area (e.g., parks) from noise similar or less than pre-hurricane levels. A small part of Shell Island within St. Andrew State Park would be exposed to noise of 65 dB DNL.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. On-base land use would be compatible with the base comprehensive plan. No off-base noise impacts on surrounding land use. Off-base land use for housing would be compatible with local planning and zoning.

The additional military households could generate a demand for residential development. Limited supply of affordable homes in Santa Barbara North County could result in development of residential land in cities of Lompoc, Santa Maria, Guadalupe, and/or Buellton.

No noise effects would occur on off-base recreational areas or beaches.

ES.3.2.11 Infrastructure

MQ-9 Wing Beddown at Tyndall AFB Alternative. The capacity of Tyndall AFB's infrastructure, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would continue to operate below capacity and would not be affected by the slightly increased demand over current conditions. No significant impacts to infrastructure are anticipated.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. The capacity of Vandenberg AFB's infrastructure, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would have adequate capacity for the increased demand. No significant impacts to infrastructure are anticipated.

ES.3.2.12 Transportation

MQ-9 Wing Beddown at Tyndall AFB Alternative. The MQ-9 Main Runway Option would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue, particularly during the morning and afternoon peak periods. The intersection would operate at LOS F, below an acceptable LOS for highway facilities. Impacts would be significant. Delays at the intersection would be approximately 5 minutes and 1.5 minutes for the morning and afternoon peak periods, respectively.

The MQ-9 Alternate Runway Option includes a new gate on US-98 to divert traffic from the main gate and lessen the impact at the main gate. Congestion on US-98 would be moderate, as it is the primary highway serving the base.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. During afternoon peak hour, traffic conditions would be at unacceptable levels at the intersections of Cabrillo Highway 1 (CA-1) and Lompoc Casmalia Road (LOS D) and Santa Lucia Canyon Road and Pine Canyon Road (LOS F). In addition, LOS D would occur at the intersection of CA-1 and Lompoc Casmalia Road during the morning peak period.

Impacts to these two intersections and two road segments would be significant according to the California Department of Transportation (Caltrans) guidelines, which consider LOS D and below to be unacceptable.

ES.3.2.13 Socioeconomics

MQ-9 Wing Beddown at Tyndall AFB Alternative. A total increase of 1,900 USAF personnel would occur at a rate of 475 personnel per year from 2022 through 2025. There would be a total of 2,584 dependents including 1,292 children. The estimated 950 school-age children would

increase enrollment in Bay County schools by an estimated 238 students per year from 2022 through 2025. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 1,080 jobs, or approximately 270 jobs added per year from 2022 through 2025. Construction costs for MQ-9 facilities of $400 million would result in a total of direct, indirect, and induced jobs of approximately 985 jobs in 2021, rising to 1,675 in 2024. The MQ-9 Wing beddown would result in an estimated on-base and off-base increase in jobs of 985 in 2021, to 3,910 jobs in 2024, and then leveling off at approximately 2,980 jobs after 2025.

There would be a USAF annual demand for approximately 417 off-base housing units, stabilizing at 1,589 additional units by 2025. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,837 housing units in the community for the years 2022 through 2025. When combined with the off-base USAF housing demand of 1,589 units, this would produce a total 2024 demand for 3,426 housing units. MQ-9 induced housing demand would drop back to a demand for 1,589 off-base units for USAF personnel plus units for 720 secondary personnel housing, for a total demand for 2,309 housing units after 2025.

There would be a demand for additional public service personnel throughout Bay County. For example, there would be a demand for an additional 10 policemen, 7 firemen, and 11 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. The public service and education personnel would add to the demand for housing.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. A total increase of 1,900 USAF personnel would occur at a rate of 475 personnel per year from 2022 through 2025. There would be 2,584 dependents including 1,292 children. The estimated 950 school-age children would increase enrollment in Santa Barbara County schools by an estimated 238 students per year from 2022 through 2025. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 760 jobs, or approximately 190 jobs added per year from 2022 through 2025. Construction costs for MQ-9 facilities of $400 million would result in a total of direct, indirect, and induced jobs of approximately 915 jobs in 2021, rising to 1,496 in 2022, and to 1,437 in 2024. The MQ-9 Wing would result in an estimated on-base and off-base increase in jobs of 915 in 2021, to 3,432 jobs in 2024, and then leveling off at approximately 2,660 jobs after 2025.

There would be a USAF annual demand for approximately 417 off-base housing units, stabilizing at 1,589 additional units by 2025. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 1,338 housing units in the community by 2024. When combined with the demand for 1,589 USAF off-base housing units, this would result in a total demand of 2,587 units by the end of 2024. MQ-9 induced housing demand would drop back to a demand for 1,589 off-base units for USAF personnel plus 507 units for secondary personnel, for a total demand for 2,096 housing units after 2025.

There would be a demand for additional public service personnel throughout Santa Barbara County. For example, there would be a demand for an additional 10 policemen, 7 firemen, and

11 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. The public service and education personnel would add to the demand for housing.

ES.3.2.14 Environmental Justice

MQ-9 Wing Beddown at Tyndall AFB Alternative. No off-base populations or noise-sensitive locations would be exposed to noise levels of 65 dB DNL or greater from MQ-9 aircraft operations at Tyndall AFB, and no off-base populations would be within the APZs. There would be no direct impacts to minority or low-income populations or children or elderly populations residing off base.

Increased demand for off-base housing from USAF personnel, construction workers, and secondary workers in a market with a hurricane-reduced housing supply could amplify any adverse impacts on low-income residents since low-income residents typically spend a larger proportion of their income on housing than the general population.

MQ-9 Wing Beddown at Vandenberg AFB Alternative. No off-base populations or noise-sensitive locations would be exposed to noise levels of 65 dB DNL or greater from MQ-9 aircraft operations at Vandenberg AFB and no off-base populations would be within the APZs. There would be no direct impacts to minority or low-income populations or children or elderly populations residing off base.

Increased demand for off-base housing from USAF personnel, construction workers, and secondary workers in a tight housing market could amplify any adverse impacts on low-income residents since low-income residents typically spend a larger proportion of their income on housing than the general population. USAF policies that identify certain housing and commute distances as unacceptable reduce off-base demand for low-cost housing by USAF personnel.

ES.3.2.15 No Action Alternative for the Proposed MQ-9 Wing Beddown

Under the No Action Alternative, there would be no MQ-9 mission at Tyndall AFB or Vandenberg AFB. This means that there would be no environmental effects from an MQ-9 Wing beddown for any environmental resource. Should the USAF independently decide on the No Action Alternative for the proposed F-35A Wing beddown at Tyndall AFB, environmental conditions at Tyndall AFB would be as described in EIS Section 3.1. Should the USAF independently decide to beddown the proposed F-35A Wing at Tyndall AFB, environmental conditions under the No Action Alternative for the proposed MQ-9 Wing beddown would be as described in Section ES.3.1 and EIS Section 4.1.

ES.3.3 COMBINED F-35A WING AND MQ-9 WING BEDDOWN AT TYNDALL AFB

ES.3.3.1 Airspace Management and Air Traffic Control

Three-Squadron F-35A Wing plus MQ-9 Wing. No significant impacts to airfield operations or training airspace would occur. An MQ-9 Wing beddown would add 2,820 training sorties to the

estimated 12,300 F-35A training sorties, which would add an estimated 5,700 airfield operations to the estimated 33,440 three-squadron F-35A airfield operations. Given the highly regulated manner in which RPA flights are controlled in both the airfield and unrestricted airspace, MQ-9 operations could be safely integrated with F-35A and other aircraft flight activities. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB.

Four-Squadron F-35A Wing plus MQ-9 Wing. No significant impacts to airfield operations or training airspace would occur. An MQ-9 Wing beddown would add 2,820 training sorties to the estimated 16,400 F-35A training sortie which would add an estimated 5,700 airfield operations to the estimated 44,600 four-squadron F-35A airfield operations. Given the highly regulated manner in which RPA flights are controlled in both the airfield and unrestricted airspace, MQ-9 operations could be safely integrated with F-35A and other aircraft flight activities. For context, under pre-hurricane conditions, there were 37,900 F-22 and 11,800 T-38 airfield operations at Tyndall AFB.

ES.3.3.2 Noise

Three-Squadron F-35A Wing plus MQ-9 Wing. The number of off-base acres of land exposed to noise levels greater than 65 dB DNL would increase from 2 acres to as many as 69 acres, and the number of people exposed would increase from 0 to as many as 80 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, there were 217 off-base acres of land and an estimated 190 people exposed to noise levels greater than 65 dB DNL

Compared with the No Action Alternative with no active F-22 mission, proposed F-35A and MQ-9 operations would result in an increase at noise-sensitive locations by as much as 14 dB DNL under any of the afterburner take-off scenarios. Noise levels at Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to levels louder than 65 dB, 70 dB, and 80 dB, respectively, under any afterburner scenario and would result in the same incompatible land uses under pre-hurricane conditions based on DoD guidelines. The DNL at representative noise-sensitive locations would be uniformly lower with the F-35A and MQ-9 operations than under pre-hurricane conditions.

The number of outdoor speech-interference events per hour would increase from two events under the No Action Alternative to as many as seven events (under any afterburner scenario). To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions.

Noise at Tyndall Elementary School would exceed classroom criteria, with exterior school-day noise levels as loud as 75 dB $L_{eq\text{-}8hr}$. Events with potential to interfere with speech would increase by as many as five to six events per average hour, with windows open or closed, relative to the No Action Alternative with no active F-22 mission. To put the effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Noise at Parker Elementary School would remain below classroom criteria under all afterburner-usage scenarios.

The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent compared with 1 percent under the No Action Alternative. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions.

Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal under all afterburner-usage scenarios.

MQ-9 operations at mission altitude are below typical ambient noise levels and would not add to overall noise beneath overland training airspace from subsonic aircraft operations. F-35A operations increase noise up to as much as 48 dB L_{dnmr} (a 3-dB increase). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. Numbers of sonic booms in warning areas would decrease with F-35A operations compared with pre-hurricane F-22 flights.

Four-Squadron F-35A Wing plus MQ-9 Wing. The number of off-base acres of land exposed to noise louder than 65 dB DNL would increase from 2 acres to as many as 93 acres, and the number of people exposed would increase from 0 to as many as 136 when compared with the No Action Alternative with no active F-22 mission. For context, prior to Hurricane Michael, 217 off-base acres of land and an estimated 190 people were exposed to noise levels greater than 65 dB DNL.

The DNL at representative locations would increase by as much as 15 dB under any of the afterburner take-off scenarios relative to the No Action Alternative with no active F-22 mission. Noise at the Long Point Condominiums, Tyndall Elementary School, and Tyndall AFB dormitories would increase to levels louder than 70 dB, 70 dB, and 80 dB, respectively, and would result in the same incompatible land uses under pre-hurricane conditions based on DoD guidelines. The DNL at representative noise-sensitive locations would be uniformly lower with the F-35A and MQ-9 operations than noise levels under pre-hurricane conditions.

The number of outdoor speech-interference events would increase from 2 events per hour to as many as 10 to 12 events per average hour relative to the No Action Alternative. To put the speech-interference events in context, the number of events would decrease or remain the same at all locations studied when compared with pre-hurricane conditions.

Noise at Tyndall Elementary School would exceed classroom criteria, with exterior school-day noise levels of up to 76 dB $L_{eq\text{-}8hr}$. Events with potential to interfere with speech would increase from one under the No Action Alternative to as many as six to eight events per average hour (with windows open) or six to seven events per average hour (with windows closed) relative to the No Action Alternative. To put the effect in context, noise levels and potential speech-interference events at Tyndall Elementary School would remain the same or decrease compared with pre-hurricane conditions. Noise at Parker Elementary School would remain below classroom criteria under all afterburner-usage scenarios.

The percentage of people awakened at least once per night by aircraft noise would increase to as much as 2 percent compared to the No Action Alternative with no active F-22 mission. The percentage awakened would decrease or remain the same relative to pre-hurricane conditions.

Risk of potential hearing loss, workplace noise impacts, and nonauditory health impacts would remain minimal under all afterburner-usage scenarios.

Noise from MQ-9 operations at mission altitude are below typical ambient noise levels and would not add to overall subsonic aircraft operations noise levels beneath overland training airspace. F-35A operations would increase noise up to as much as 49 dB L_{dnmr} (a 4-dB increase). Time-averaged noise levels would remain similar to 45 dB, which is a level typical of rural areas with no aircraft noise. Numbers of sonic boom in warning areas would decrease with F-35A operations as compared with pre-hurricane F-22 flights.

ES.3.3.3 Health and Safety

Three-Squadron F-35A Wing plus MQ-9 Wing. No significant impacts would occur. Initiation of F-35A flight operations would result in an increase from approximately 6 to an estimated 19 BASH incidents per year, approximately the same as the annual average prior to 2018. Based on the projected Class A mishap rates and combined operations, there would be a statistical increase in the potential for aircraft mishaps compared with No Action. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible.

There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft ("lost-link"). Under such circumstances, aircraft are programmed to return to base for direct line-of-sight control. Existing flight safety procedures combined with the nature of the MQ-9 operational areas (i.e., over low population or military-controlled lands or over water) would minimize any impacts.

Four-Squadron F-35A Wing plus MQ-9 Wing. No significant impacts would occur. Initiation of F-35A flight operations would result in an increase from approximately 6 to an estimated 21 BASH incidents per year, approximately the same as the average prior to 2018. Based on the projected Class A mishap rates and combined operations, there would be a statistical increase in the potential for aircraft mishaps compared with No Action. Training and construction activities would be conducted in accordance with applicable USAF, state, and federal safety standards and requirements. F-35As would not deploy combat coded flares in SUA. Safety impacts to the public resulting from training flare use would be negligible.

There is a potential for MQ-9 mishaps resulting from loss of satellite communications with the aircraft ("lost-link") as described for the three-squadron F-35A Wing plus MQ-9 Wing beddowns.

ES.3.3.4 Air Quality

Three-Squadron F-35A Wing plus MQ-9 Wing. Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality

Annual operational emissions of VOCs, SO_x, PM_{10}, NO_x, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 1.0 percent change (increase) in the total CO emissions generated within Bay County in 2017 and would not result in

any significant impacts to air quality. These emission increases are lower than the amounts of CO emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions.

Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality.

Four-Squadron F-35A Wing plus MQ-9 Wing. Annual emissions from construction would remain below all initial indicators of significance and would not result in any significant impacts to air quality

Annual operational emissions of VOCs, SO_x, PM_{10}, and $PM_{2.5}$ would not exceed any initial indicator of significance and would produce less than significant air quality impacts. Annual operational emissions of CO and NO_x would exceed the 250 tons per year initial indicator of significance. However, these operational emissions would only result in approximately a 1.2 and 3.6 percent change (increase) in the total CO and NO_x emissions generated within Bay County in 2017, respectively, and would not result in any significant impacts to air quality. These emission increases are lower than the amounts of CO and NO_x emissions produced by Tyndall AFB in 2017 in comparison to the 2017 Bay County emissions. Flight operational emissions from flying in airspaces and over ranges for training would remain below all initial indicators of significance, and there would be no significant impacts to air quality.

ES.3.3.5 Hazardous Materials and Waste

Three-Squadron F-35A Wing plus MQ-9 Wing. Minor hazardous materials and wastes would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations.

Four-Squadron F-35A Wing plus MQ-9 Wing. Minor hazardous materials and wastes would be generated from construction, operations, and maintenance. Impacts would be minimized with implementation of appropriate and established handling procedures. Construction within and adjacent to multiple ERP sites would require following USAF regulations.

ES.3.3.6 Soils and Geologic Resources

Three-Squadron F-35A Wing plus MQ-9 Wing. Construction required for the F-35A and MQ-9 combined actions would temporarily disturb 276 acres for an approximately 37-acre footprint with MQ-9 Maintenance Complex Option 1 or 834 acres for an approximately 50-acre footprint with MQ-9 Maintenance Complex Option 2. Implementing standard construction practices in accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring.

Four-Squadron F-35A Wing plus MQ-9 Wing. Construction required for the F-35A and MQ-9 combined actions would temporarily disturb 276 acres for an approximately 39-acre footprint with MQ-9 Maintenance Complex Option 1 or 834 acres for an approximately 50-acre footprint with MQ-9 Maintenance Complex Option 2. Implementing standard construction practices in

accordance with an NPDES Construction General Stormwater Permit, the SWPPP, and other BMPs would result in no significant impacts occurring.

ES.3.3.7 Water Resources

Three-Squadron F-35A Wing plus MQ-9 Wing. Water resources could be affected differently depending on the MQ-9 option. Construction of the F-35A and MQ-9 facilities on the main runway would disturb at least 276 acres of land and, depending on facility siting, resulting in 10.5 to 42.5 acres of new impervious surfaces.

With the F-35A Wing beddown MQ-9 Alternate Runway Option, construction would disturb at least 834 acres of land and, depending on facility siting, result in 27 to 50 acres of new impervious surfaces. BMPs and LID methods employed to control erosion and pollution during construction would minimize impacts to water resources under this combination of alternatives. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program.

Four-Squadron F-35A Wing plus MQ-9 Wing. Water resources could be affected differently depending on the MQ-9 option. Construction of the F-35A and MQ-9 facilities on the main runway would disturb approximately 276 acres of land and, depending on facility siting, result in 10.5 to 44.5 acres of new impervious surfaces.

With the F-35A beddown, MQ-9 Alternate Runway Option, construction would disturb approximately 834 acres of land and, depending on facility siting, result in 27 to 52 acres of new impervious surfaces. BMPs and LID methods employed to control erosion and pollution during construction would minimize impacts to water resources under this combination of alternatives. Construction would be consistent with the enforceable policies of Florida's Coastal Management Program.

ES.3.3.8 Biological Resources

Three-Squadron F-35A Wing plus MQ-9 Wing. Construction would result in the loss of up to 33.5 acres of vegetation/wildlife habitat and the loss of up to 11.4 acres of wetlands (MQ-9 Maintenance Complex Option 1) or the loss of up to 629.5 acres of vegetation/wildlife habitat and 306.7 acres of wetlands (Maintenance Complex Option 2). In a letter dated August 3, 2020, consultation with the USFWS Panama City Field Office concluded with their concurrence with the USAF determination of *No Effect* and *not likely to adversely affect* to threatened and endangered species at Tyndall AFB.

Four-Squadron F-35A Wing plus MQ-9 Wing. Biological effects would be the same as described for the three-squadron F-35A Wing plus MQ-9 Wing beddowns.

ES.3.3.9 Cultural Resources

Three-Squadron F-35A Wing plus MQ-9 Wing. There are no historic properties in the APE for direct impacts. In a letter dated July 29, 2020, the Florida SHPO concurred with the USAF

determination that the proposed F-35A Wing and MQ-9 Wing beddown undertakings will have no effect to historic properties listed or eligible for listing in the NRHP.

Four-Squadron F-35A Wing plus MQ-9 Wing.

Effects would be the same as the three-squadron F-35A beddown alternative.

ES.3.3.10 Land Use and Recreation

Three-Squadron F-35A Wing plus MQ-9 Wing. On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 61 and 68 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 10 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This acreage is less than had been exposed to comparable noise levels before the hurricane. There are no land use effects from small differences in off-base noise from variations in modeled afterburner use. The USAF is working closely with the off-base communities to provide information that can be used for community land use planning decisions.

Additional military households would create a need for off-base residential development. Available residential land was affected by the hurricane, and demand could increase the strain on local resources in the midst of ongoing hurricane recovery. There could be moderate impact on local land use.

Some residents living in areas underlying training airspace or long-term visitors to the Mud Swamp Wilderness Area could be annoyed by additional overflights and associated noise.

The projected increase in military households living off base could result in increased demand for community recreational resources (parks, playgrounds, public recreational centers, swimming pools, etc.). Military personnel would continue to use on base recreational resources.

Four-Squadron F-35A Wing plus MQ-9 Wing. On-base land use would be compatible with the base reconstruction plan following the hurricane. Off-base land use would be compatible with reconstruction of hurricane-destroyed housing and other facilities. Between 84 and 93 acres of off-base land would be exposed to noise levels of 65 dB DNL or greater, including up to 18 acres of incompatible residential land on the peninsula leading to DuPont Bridge. This is fewer acres than had been exposed to comparable noise levels before the hurricane. There would be no land use effects from small differences in off-base noise from variations in modeled afterburner use. The USAF is working closely with the off-base communities to provide information that can be used for community land use planning decisions.

Additional military households would create a need for off-base housing and could generate a need for residential development. Available residential land is limited due to hurricane damage, and residential land could become more difficult to develop. Shortages of residential land could increase the time and cost to develop new housing. There could be possible high impact on local land use.

Some residents living in areas underlying training airspace or long-term visitors to the Mud Swamp Wilderness Area could be annoyed by additional overflights and associated noise.

The projected increase in military households living off base could result in moderate impacts to community recreational resources (parks, playgrounds, public recreational centers/swimming pools, etc.). Potential for moderate impact on local recreational resources. Military personnel would continue to use on base recreational resources.

ES.3.3.11 Infrastructure

Three-Squadron F-35A Wing plus MQ-9 Wing. There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions. Contracts with Bay County for potable water and wastewater service would need to be revised to reflect higher demands for service.

Four-Squadron F-35A Wing plus MQ-9 Wing. There would be no significant impacts to the base infrastructure following post-hurricane reconstruction. The infrastructure capacity, including potable water, sanitary sewer system, stormwater discharge system, solid waste, electrical, and natural gas, would not be affected by an increased demand over the affected environment conditions. Contracts with Bay County for potable water and wastewater service would need to be revised to reflect higher demands for service. Additional interconnection capacity with Bay County may be needed for potable water, and storage requirements may increase on base as a result of new building construction and personnel increases.

ES.3.3.12 Transportation

Three-Squadron F-35A Wing plus MQ-9 Wing. The F-35A three squadron beddown in combination with the MQ-9 Main Runway Option would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98. The LOS would decrease to LOS F for all analyzed facilities. Delays would be significant under this alternative (over 11 minutes of control delay at the intersection), with volume-to-capacity (V/C) ratios of up to 2.7 at the intersection.

F-35A beddown in combination with the MQ-9 Alternate Runway Option: The combination of alternatives would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98. A new gate would be included on US-98 that would divert a portion of the traffic from the main gate and lessen the impact at the main gate. However, the LOS would still decrease to LOS F for all analyzed facilities.

The combination of the F-35A beddown with either MQ-9 beddown option would result in significant impacts.

Four-Squadron F-35A Wing plus MQ-9 Wing. The F-35A four squadron beddown in combination with the MQ-9 Main Runway Option would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98. The LOS would

decrease to LOS F for all analyzed facilities. Delays would be significant under this alternative (nearly 11 minutes of control delay at the intersection), with V/C ratios of up to 3.0 at the intersection. This means that there would be three times as much traffic as the intersection could handle.

The F-35A beddown in combination with the MQ-9 Alternate, or Drone, Runway Option would generate additional traffic at the intersection of US-98, Tyndall Drive, and Airey Avenue and along US-98. A new gate would be included on US-98 that would divert a portion of the traffic from the main gate and lessen the impact at the main gate. However, the LOS would still decrease to LOS F for all analyzed facilities.

The combination of either F-35A beddown alternative with either MQ-9 beddown option would result in significant impacts to transportation.

ES.3.3.13 Socioeconomics

Three-Squadron F-35A Wing plus MQ-9 Wing. An increase of 4,100 USAF personnel would be accompanied by 5,576 dependents including 2,788 children. The estimated 2,049 school-age children would substantially increase enrollment in Bay County schools. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 2,284 jobs, or approximately 571 jobs added per year from 2022 through 2025.

Construction costs for Three-Squadron F-35A and MQ-9 facilities of $720 million would create secondary employment. The estimated total increase in on-base and off-base jobs would be 1,642 in 2021 up to 9,172 jobs by the beginning of 2025, and then level off at approximately 6,384 jobs from 2026 and onward.

There would be an annual demand for USAF off-base housing, stabilizing at 3,608 additional units by the end of 2026. Construction workers and secondary employees would also demand housing. The additional demand by construction and secondary workers would be for up to 3,382 housing units in the community by the end of 2024. Adding that to the 3,608 USAF off-base housing demand would result in a total demand of 6,990 units by 2026. The demand for construction labor would exceed the county's capacity and require substantial additional in-migration of personnel. In-migrating construction workers would compete for housing and other services with other Bay County residents.

Housing costs in the next several years could continue rising by 10 to 15 percent or more per year as supply tries to catch up with demand before leveling off, or even declining, as construction workers no longer contribute to housing demand. USAF-related direct and secondary off-base housing demand would decline to 5,131 units after 2026.

There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 21 policemen, 15 firemen, and 25 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. The public service and education personnel would add to the demand for housing.

Four-Squadron F-35A Wing plus MQ-9 Wing. A total increase of 4,832 USAF personnel would occur at a rate of 1,063 personnel per year from 2022 through 2025 plus 800 personnel in 2026. There would be a total of 6,572 dependents including 3,286 children. The estimated 2,415 school-age children would substantially increase enrollment in Bay County schools by an estimated 532 students per year from 2022 through 2025 and 293 students in 2026. USAF personnel expenditures would create indirect and induced employment of the equivalent total of an additional 2,689 jobs, or approximately 592 jobs added per year from 2022 through 2025 and 321 jobs in 2026. Construction costs for Four Squadron F-35A and MQ-9 facilities of $800 million would create direct, indirect, and induced employment and earnings.

The estimated total increase in USAF on-base and secondary off-base jobs would be 2,299 in 2021 up to 9,403 jobs at the end of 2024, and then level off at approximately 7,522 jobs from 2026 and onward.

There would be an annual demand for USAF personnel off-base housing, stabilizing at 4,280 additional units by 2026. Construction workers and secondary employees would also demand housing, and, assuming a labor participation rate of 1.5 jobs per household, there would be an additional demand by construction and secondary workers for up to 3,438 housing units in the community by the beginning of 2025. Adding that to the 2025 USAF off-base housing demand of 4,280 would result in a peak demand of 7,718 units by 2025. The demand for construction labor would exceed the county's capacity and require additional in-migration of personnel. In-migrating construction workers would compete for housing and other services with other Bay County residents.

Housing costs in the next several years could continue rising by 10 to 15 percent or more per year as supply tries to catch up with demand before leveling off, or even declining, as construction workers no longer contribute to housing demand. USAF direct and secondary off-base housing demand would decline to 6,073 units from 2026 and onward.

There would be a demand for additional public service personnel throughout Bay County. For example, there would be a calculated demand for an additional 25 policemen, 17 firemen, and 29 medical personnel to support off-base USAF families by 2026. There could be a substantially greater number of service personnel needed during construction. The public service and education personnel would add to the demand for housing.

ES.3.3.14 Environmental Justice

Three-Squadron F-35A Wing plus MQ-9 Wing. MQ-9 flight operations do not add to off-base noise above the F-35A noise. The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise.

The large increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected. The increased demand would impact all income levels.

There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction.

No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions.

Four-Squadron F-35A Wing plus MQ-9 Wing. MQ-9 flight operations do not add to off-base noise over that experienced with the F-35A. The percent of minority and low-income populations in the census block group, defined as the ROI, does not exceed the percent of minority and low-income populations in the census tract, defined as the COC. There would be no disproportionately high and adverse impacts to environmental justice communities from aircraft noise.

The substantial increase in the demand for housing combined with the hurricane destruction of housing will increase housing costs, and low-income residents who typically spend a larger proportion of their income on housing than the general population could be especially affected. The increased demand would impact all income levels.

There are no schools, daycares, hospitals, or nursing homes located off-base within any afterburner scenario 65 dB DNL noise contour. The increase in USAF-related students would result in more funds for schools to restore education impacted by the hurricane destruction.

No populations reside within the APZs. The off-base acreage within the 65 dB DNL or greater noise contour is less than under pre-hurricane conditions.

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