

**Draft Environmental Assessment  
Combat Air Forces Contracted Adversary Air Temporary  
Operations From Tyndall AFB, Florida**

**June 2020**



**United States Air Force**

**325<sup>th</sup> Fighter Wing  
Tyndall Air Force Base, Florida**



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### **PRIVACY ADVISORY**

This Draft Environmental Assessment (EA) is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR Parts 1500 to 1508), and 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*.

The EIAP provides an opportunity for public input on Air Force decision-making, allows the public to offer inputs on alternative ways for the Air Force to accomplish what it is proposing, and solicits comments on the Air Force's analysis of environmental effects.

Public commenting allows the Air Force to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

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3 **COVER SHEET**  
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5 **DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR COMBAT AIR FORCES CONTRACTED ADVERSARY AIR**  
6 **FROM**  
7 **TYNDALL AIR FORCE BASE**

- 8 a. *Responsible Agency:* United States Air Force (Air Force)
- 9 b. *Cooperating Agency:* None
- 10 c. *Proposals and Actions:* The environmental assessment (EA) analyzes a Proposed Action to provide dedicated  
11 contract adversary air (ADAIR) sorties for Combat Air Forces training on a temporary basis from Tyndall Air Force  
12 Base (AFB) in support of the pilots of the 33<sup>rd</sup> Fighter Wing and 325<sup>th</sup> Fighter Wing operating from Eglin AFB,  
13 Florida. The Air Force proposes to temporarily operate contract ADAIR from Tyndall AFB, FL for up to 24 months.  
14 The Proposed Action would include the addition of 78 contracted maintainers and 15 contracted pilots.  
15 Approximately 2,320 contracted sorties would be added to perform training activities within Warning Areas W-151  
16 and W-470, the Rose Hill Military Operations Area (MOA)/Air Traffic Control Assigned Airspace (ATCAA), the Eglin  
17 E MOA/ATCAA, and the Tyndall B, C/H and E MOAs, the Compass Lake and Carrabelle ATCAAs. The existing  
18 facilities at Tyndall AFB would include the required ramp space; maintenance space; operational space; petroleum,  
19 oil and lubricant storage; runway access; and associated parking to support the Proposed Action. The Proposed  
20 Action in addition to the No Action Alternative was evaluated in the EA.
- 21 d. *For Additional Information:* 325 CES/CEIEC, Attn: Draft Environmental Assessment for Combat Air Forces  
22 Contracted Adversary Air From Tyndall Air Force Base, Florida. 540 Mississippi Ave Building 36270 Tyndall AFB,  
23 FL 32403
- 24 e. *Designation:* Draft EA
- 25 f. *Abstract:* This EA has been prepared pursuant to provisions of the National Environmental Policy Act (NEPA), Title  
26 42 United States Code Sections 4321 to 4347, implemented by Council on Environmental Quality Regulations,  
27 Title 40, Code of Federal Regulations (CFR) Parts 1500 to 1508, and 32 CFR Part 989, *Environmental Impact*  
28 *Analysis Process (EIAP)*. Potentially affected environmental resources were identified in coordination with local,  
29 state, and federal agencies. Specific environmental resources with the potential for environmental consequences  
30 include airspace management and use; noise; safety; air quality; biological resources; cultural resources; and  
31 hazardous waste and material.

32 The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality of training  
33 and readiness for pilots of the 33<sup>rd</sup> Fighter Wing located at Eglin AFB, Florida and the 325<sup>th</sup> Fighter Wing,  
34 temporarily located at Eglin AFB. By providing a dedicated contract ADAIR capability, F-35 and F-22 pilots would  
35 gain more realistic air-to-air training during their training syllabus tasks. Dedicated contract ADAIR would also allow  
36 the unit to free up resources used to self-generate ADAIR and more effectively use those available flying hours.  
37 Additionally, other Air Force units that are tasked to provide ADAIR training support at Eglin AFB could recapitalize  
valuable flying hours to focus on increasing their own levels of proficiency and readiness.

38 Contract ADAIR training scenarios would include the use of combat tactics and procedures that differ from Combat  
39 Air Forces tactics to simulate an opposing force. The elements affecting Tyndall AFB would be contract ADAIR  
40 aircraft, facilities, maintenance, personnel, and sorties. Elements affecting the airspace would be airspace use and  
41 defensive countermeasures. The Proposed Action at Tyndall AFB would include the establishment of an estimated  
42 78 contracted maintainers and 15 contracted pilots who would operate an estimated 12 aircraft. Six aircraft types  
43 (MiG-29, F-5, Dassault Mirage, F-16, Eurofighter Typhoon, JAS-39 Gripen) have been identified as capable of  
44 providing contract ADAIR support for Eglin AFB based on performance capabilities of the aircraft and how those  
45 capabilities best meet mission training requirements at the installation. Contract ADAIR service providers may  
46 ultimately choose another type of aircraft to support Air Force ADAIR needs for Eglin AFB; however, any aircraft  
47 selected would need to operate within the parameters and impact levels evaluated within this EA or supplemental  
48 NEPA analysis would be required. The facilities proposed to support contract ADAIR at Tyndall AFB are available  
49 for use and include the required ramp space; maintenance space; operational space; petroleum, oil and lubricant  
50 storage; runway access; and associated parking to support the Proposed Action.

51 The analysis of the affected environment and environmental consequences of implementing the Proposed Action  
52 and alternatives concluded that by implementing standing environmental protection measures and Best  
53 Management Practices, there would be no significant adverse impacts from contract ADAIR operations at Tyndall  
54 AFB or in the special use airspace on the following resources: airspace management and use; noise; safety; air  
55 quality; biological resources; land use; socioeconomics – income and employment; environmental justice and  
56 protection of children; cultural resources; and hazardous materials and wastes, contaminated sites, and toxic  
57 substances. Tyndall AFB is an active installation with demolition and new construction actions currently underway  
58 as well as future development currently in the planning phase; however, significant cumulative impacts are not  
59 anticipated from activities associated with the Proposed Action when considered with past, present, or reasonably  
60 foreseeable future actions.

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1                                   **DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)**

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3                                   **COMBAT AIR FORCES CONTRACTED ADVERSARY AIR IN SUPPORT OF**

4   **EGLIN AIR FORCE BASE, FLORIDA**

5   **FROM**

6   **TYNDALL AIR FORCE BASE, FLORIDA**

7

8 Pursuant to provisions of the National Environmental Policy Act, 42 United States Code (U.S.C.) §§ 4321  
9 to 4370h; Council on Environmental Quality Regulations, 40 Code of Federal Regulations (CFR) Parts 1500  
10 to 1508; and 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*, the United States Air Force  
11 (Air Force) prepared the attached Draft Environmental Assessment (EA) to address the potential  
12 environmental consequences associated with providing contract adversary air (ADAIR) sorties for  
13 improving training and readiness of pilots at Eglin Air Force Base (AFB), Florida from Tyndall AFB.

14                                   **Purpose and Need**

15 The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality  
16 of training and readiness of 33rd Fighter Wing (33 FW) pilots located at Eglin AFB, Florida and 325<sup>th</sup> Fighter  
17 Wing (325 FW) pilots temporarily located at Eglin AFB. Contract ADAIR would operate from Tyndall AFB,  
18 Florida in support of Eglin AFB for up to 24 months while the AF determines a proposed permanent location  
19 for contract ADAIR to operate from. Contract ADAIR support would employ adversary tactics across the  
20 training spectrum from basic fighter maneuvers to higher-end, advanced, simulated, combat training  
21 missions. By providing a dedicated contract ADAIR capability, Combat Air Forces (CAF) fighter pilots would  
22 gain more realistic air-to-air training during their training syllabus tasks. Dedicated contract ADAIR would  
23 also allow the unit to free up resources used to self-generate ADAIR and more effectively use those  
24 available flying hours. Additionally, other Air Force units tasked to provide ADAIR training support for Eglin  
25 AFB could recapitalize valuable flying hours to focus on increasing their own levels of proficiency and  
26 readiness.

27 The need for the action is to provide better and more realistic training for the flight training program at Eglin  
28 AFB. Dedicated contract ADAIR is critical to improving pilot readiness as it provides realistic training  
29 opportunities to employ CAF tactics and procedures that optimize the training value of every mission.  
30 Contract ADAIR can be used in basic building block syllabus sorties or the very advanced and fluid  
31 environment of multi-aircraft air combat required by the training syllabus. Eglin AFB does not have the  
32 existing capacity to host the ADAIR mission from its flightline. Due to the near-term need for ADAIR training,  
33 a suitable temporary location with existing facilities and access to the Eglin Gulf Test and Training Range  
34 is required for ADAIR operations to support the 33<sup>rd</sup> and 325<sup>th</sup> Fighter Wings.

35                                   **Description of Proposed Action and Alternatives**

36 The Proposed Action would provide dedicated contract ADAIR sorties for CAF training to support the 33<sup>rd</sup>  
37 Fighter Wing and 325<sup>th</sup> Fighter Wing at Eglin AFB. Contract ADAIR would operate from Tyndall AFB for up  
38 to 24 months while the AF determines a permanent location. Training scenarios would include the use of  
39 combat tactics and procedures that differ from CAF tactics to simulate an opposing force. The elements  
40 affecting Tyndall AFB include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The  
41 elements affecting the airspace include airspace use and defensive countermeasures.

42 The Proposed Action at Tyndall AFB would include the establishment of an estimated 78 contracted  
43 maintainers and 15 contracted pilots who would operate an estimated 12 aircraft. Six aircraft types (MiG-29,  
44 F-5, Dassault Mirage, F-16, Eurofighter Typhoon, and JAS-39 Gripen) have been identified as capable of  
45 providing contract ADAIR support to CAF aircrews stationed at Eglin AFB. One or a combination of these  
46 aircraft types may be operated by a contractor at Tyndall AFB in support of ADAIR training. Contract ADAIR  
47 operations are proposed to occur in Building 503. Aircraft Maintenance Unit activities, including hangar  
48 space for aircraft maintenance, are proposed to be conducted in a temporary clamshell-like structure to be  
49 erected on existing pavement in the flightline area. Following training sorties, contract ADAIR pilots would  
50 land and park their aircraft at Tyndall AFB on the ramp area. The facilities proposed for use at Tyndall AFB

1 are available and include the required ramp space; maintenance space; operational space; petroleum, oil  
2 and lubricant storage; runway access; and associated parking to support the Proposed Action.

3 Contract ADAIR capabilities would be established using an estimated 12 aircraft providing 2,400 annual  
4 sorties in support of Eglin AFB. Of the 2,400 annual sorties, approximately 2,320 sorties annually would  
5 support training activities within nearby special use airspace including the Eglin E Military Operations Area  
6 (MOA)/Air Traffic Control Assigned Airspace (ATCAA), the Rose Hill MOA/ATCAA, Warning Areas W-151  
7 and W-470, the Tyndall B, C/H and E MOAs and the Compass lake and Carrabelle ATCAAs. The remaining  
8 80 annual sorties encompasses contractor aircraft fleet sustainment sorties. Contract ADAIR aircraft would  
9 employ chaff and flares in all the special use airspace with the exception of Rose Hill MOA where only  
10 flares would be employed and the Tyndall C MOA, where no chaff or flares would be employed.

### 11 **No Action Alternative**

12 No action means that an action would not take place, and the resulting environmental effects from taking  
13 no action would be compared with the effects of allowing the proposed activity to go forward. Under the No  
14 Action Alternative, contract ADAIR would not operate from Tyndall AFB. No action for this EA reflects no  
15 contract ADAIR support for Eglin AFB would occur.

### 16 **Summary of Findings**

17 Potentially affected environmental resources were identified through communications with state and federal  
18 agencies and review of past environmental documentation. Specific environmental resources with the  
19 potential for environmental consequences include airspace management and use; noise; safety; air quality;  
20 biological resources; cultural resources; and hazardous waste and material.

21 The baseline conditions at Tyndall AFB have substantially changed since Hurricane Michael struck the  
22 base in October 2018. The pre-hurricane conditions of 2018 are presented for resource areas where it  
23 would be useful as a point of comparison to provide context to the environmental impacts for the local public  
24 and decision makers. The 2018 baseline conditions included the 43rd Fighter Squadron F-22 formal  
25 training unit (FTU) and supporting 2nd Fighter Training Squadron T-38s, and the 95<sup>th</sup> Fighter Squadron F-  
26 22 operational squadron. The environmental consequences of contract ADAIR are assessed against these  
27 conditions and current operations for purpose of comparison. The 43rd Fighter Squadron and 2nd Fighter  
28 Training Squadron have been temporarily assigned to Eglin AFB, FL and the 95<sup>th</sup> Fighter Squadron aircraft  
29 were distributed to other Air Force F-22 squadrons. The Air Force is not proposing to return F-22s to  
30 Tyndall AFB. The AF has proposed beddowns of F-35A aircraft and an MQ-9 wing at Tyndall AFB. This  
31 contract ADAIR proposal at Tyndall AFB would arrive and depart in a 24 month period prior to arrival of any  
32 F-35A and MQ-9 aircraft, and would not conflict with any required construction for that proposed basing  
33 action.. Under the Proposed Action, flight operations and sorties numbers at Tyndall AFB would increase  
34 from post-hurricane levels, but would represent a considerable reduction compared to 2018 pre-hurricane  
35 operational conditions.

36 Under the Proposed Action, the annual number of sorties at Tyndall AFB would be 50 percent lower than  
37 2018 pre-hurricane conditions. F-22As at Eglin still do a portion of their airfield operations at Tyndall AFB.  
38 The ADAIR mission would not impact the operational capacity or necessitate changes to the locations or  
39 dimensions of the special use airspace. Potential impacts on the airspace around the airfield from the  
40 Proposed Action would be negligible. Contract ADAIR would include an estimated 2,320 sorties in the  
41 special use airspace. The special use airspace proposed for use has the capacity and dimensions  
42 necessary to support contracted sorties; therefore, potential negligible impacts on airspace are anticipated  
43 from the Proposed Action.

44 Under the Proposed Action High Noise Scenario, the area within noise contours around the Tyndall AFB  
45 airfield would be less than the baseline due to the departure of the F-22 FTU and T-38s. In addition, noise  
46 levels at representative points of interest (POIs) identified would decrease at all POIs. Changes to the noise  
47 environment in the special use airspace would be negligible.

48 Safety zones around the airfield are not expected to change. Existing buildings that would be utilized by  
49 contract ADAIR are located outside of identified quantity-distance arcs; therefore, no impacts on explosives  
50 safety are anticipated. With an established Crash-Damaged or Disabled Aircraft Recovery program and

1 implementation of all applicable Air Force Occupational Safety and Health and Occupational Safety and  
2 Health Administration requirements, no significant impacts on ground safety are expected to occur. No  
3 significant impacts are expected to flight safety under the implementation of contractor flight safety rules  
4 and bird/wildlife-aircraft strike hazard (BASH) procedures.

5 Air emissions resulting from contract ADAIR operations at Tyndall AFB would also be less than pre-  
6 hurricane baseline conditions. The proposed project would not interfere with the region's ability to maintain  
7 compliance with National Ambient Air Quality Standards for attainment area pollutants and would not  
8 interfere with the ability to achieve compliance for pollutants that contribute to ozone nonattainment. None  
9 of the criteria pollutants emission rates would exceed the 100-tons-per-year *de minimis* threshold; therefore,  
10 no significant short-term or long-term impacts on air quality are expected from contract ADAIR operations  
11 in the airspace proposed for use.

12 Airfield management and risk reduction implementation measures associated with the BASH program  
13 would continue to reduce BASH potentially resulting in a minor impact on birds and other wildlife. Under  
14 the Proposed Action, there would be a substantial decrease in noise on Tyndall AFB and no substantial  
15 change within the special use airspace, therefore noise would potentially have a negligible, short- and long-  
16 term effect on wildlife. In addition, sonic booms from supersonic flights are expected during training  
17 activities; however, potential impacts on wildlife in the airspace associated with sonic booms are not  
18 expected. Aircraft movement at low altitudes in the Eglin E MOA, the Tyndall MOAs, W-151 and W-470  
19 could have a startle effect on some bird species although training is proposed for daytime and is not  
20 expected to impact birds that generally migrate during the night and would potentially have negligible  
21 impacts.

22 Low-flying contract ADAIR aircraft could startle the federally listed red-cockaded woodpecker (RCW), piping  
23 plover, and red knot during training operations in the Eglin E MOA. Aircraft movement at low altitudes in  
24 the Tyndall MOAs could have a startle effect on bird species including the federally listed red-cockaded  
25 woodpecker and wood stork. Although unlikely due to the large training space within the Warning Areas,  
26 federally listed sea turtles, marine mammals, Western Indian manatee, Gulf sturgeon, giant manta ray, and  
27 oceanic whitetip shark could ingest residual plastic chaff and flare components. The Air Force has made a  
28 may affect but not likely to adversely affect determination for the RCW, wood stork, piping plover, red knot,  
29 federally listed mammals, listed sea turtles, giant manta ray, Gulf sturgeon, smalltooth sawfish, and oceanic  
30 whitetip shark. Letters requesting concurrence with this determination have been sent to the National  
31 Marine Fisheries Service and United States Fish and Wildlife Service.

32 No long-term changes to the existing land use, noise environment at Tyndall AFB, or land uses under the  
33 MOAs would occur due to the Proposed Action. Contract ADAIR sorties would only occur in the special use  
34 airspace where military aircraft training already occurs. No impacts on coastal zones would occur.

35 Since there is no new construction proposed at Tyndall AFB, potential interior upgrades to facilities for  
36 contract ADAIR operations would require only a small amount of supplies and labor and therefore, would  
37 not impact the existing socioeconomic environment. The 93 contracted ADAIR maintenance personnel and  
38 pilots would represent a small increase in the over 5,600 military and civilian personnel employed at Tyndall  
39 AFB prior to the hurricane.

40 No disproportionate impacts from increased noise on minority or youth populations or low-income  
41 communities surrounding Tyndall AFB or in the Eglin MOAs are expected.

42 Building 503 is planned to be demolished under the Tyndall recovery plan, but would be retained for the  
43 time period required to accommodate contract ADAIR. Building 503 was constructed in 1987 and is not a  
44 historic building or located in a historic district. The Proposed Action would therefore have no effect, and  
45 consequently no impact, on historic properties. No known traditional cultural properties or sacred sites have  
46 been identified at Tyndall AFB nor have any been identified as part of ongoing consultation on the Proposed  
47 Action. The Proposed Action would therefore have no effect, and consequently no impact, on traditional  
48 cultural properties or sacred sites. The Proposed Action would therefore have no effect, and consequently  
49 no impact, on archaeological resources under the special use airspace.

50  
51 Hazardous waste generated as a result of contract ADAIR operations would be stored and disposed in  
52 accordance with the Tyndall AFB *Hazardous Waste Management Plan*; therefore, no impacts from

1 managing hazardous waste are expected. The proposed action would not affect Tyndall AFB ERP/IRP  
2 sites. No impacts are expected from asbestos-containing materials and lead-based paint from interior  
3 renovations of facilities proposed for use with implementation of requirements described in existing  
4 management plans. Lighting fixtures containing polychlorinated biphenyls would be disposed in accordance  
5 with federal, state, and local laws, which would potentially result in a long-term, minor, beneficial impact.  
6 There is a low potential for radon to pose a health hazard at Tyndall AFB. As such, no impacts from radon  
7 are anticipated. There is no environmental contamination known to occur within the project area.

## 8 9 **Cumulative Impacts**

10 Recovery and rebuilding efforts following Hurricane Michael, which is expected to be ongoing for several  
11 years, were considered along with other proposals. Potential short-term, negligible to minor, less than  
12 significant cumulative impacts were identified for biological resources and land use at Tyndall AFB. No  
13 potentially significant cumulative impacts were identified for the special use airspace. Increased air  
14 emissions at the installation from the Proposed Action, when considered with ongoing construction projects  
15 at Tyndall AFB, could increase particulates equal to or less than 10 microns in diameter, but those increases  
16 in emissions would be short in duration, and the potential incremental impact on air quality would be  
17 negligible. Construction and demolition projects as part of the recovery effort would continue to occur during  
18 the same period as the proposed contract ADAIR implementation. In addition, following recovery, routine  
19 construction projects would take place as part of the installation's evolving mission. Since construction  
20 noise is localized to the construction sites and would be short term, no cumulative noise impacts are  
21 anticipated. Local expenditures for post-Michael demolition and reconstruction activities on Tyndall AFB  
22 and regionally to rebuild after the devastating impacts of Hurricane Michael would contribute to the local  
23 economy over at least the next 5 years. These activities in combination with contract ADAIR would have a  
24 potential major, short-term cumulative beneficial impact on income and employment in the region; however,  
25 the demand for housing during this period of time when increased local employment to support planning  
26 and construction services is required and much of the region's housing is still damaged in combination with  
27 additional personnel to support contract ADAIR at Tyndall AFB would have a potential short-term,  
28 cumulative, minor, adverse impact on housing in the region.

## 29 **Mitigation**

30 The EA analysis concluded that the Proposed Action would not result in significant environmental impacts;  
31 therefore, no mitigation measures are required.

32 Best Management Practices are described and recommended in the EA where applicable.

## 33 **Conclusion**

34 ***Finding of No Significant Impact.*** After review of the EA prepared in accordance with the requirements  
35 of National Environmental Policy Act; Council on Environmental Quality Regulations; and 32 CFR Part 989,  
36 *Environmental Impact Analysis Process (EIAP)*, and which is hereby incorporated by reference, I have  
37 determined that the proposed activities to provide dedicated contract ADAIR sorties to improve the quality  
38 of training and readiness of pilots of the 33 FW and the 325 FW located at Eglin AFB, Florida, would not  
39 have a significant impact on the quality of the human or natural environment. Accordingly, an Environmental  
40 Impact Statement will not be prepared. This decision has been made after considering all submitted  
41 information, including a review of public and agency comments submitted during the 30-day public comment  
42 period, and considering a full range of practical alternatives that meet project requirements and are within  
43 the legal authority of the United States Air Force.

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48 **DEE JAY KATZER, Colonel, Air Force**  
49 **Chief, Civil Engineer Division (ACC/A4C)**

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**DRAFT**  
**ENVIRONMENTAL ASSESSMENT (EA)**  
**FOR**  
**COMBAT AIR FORCES CONTRACTED ADVERSARY AIR TEMPORARY**  
**OPERATIONS FROM TYNDALL AFB, FLORIDA**

PREPARED FOR:  
**Department of the Air Force**

*June 2020*





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## LIST OF ACRONYMS AND ABBREVIATIONS

1		
2		
3		
4	°F	degree(s) Fahrenheit
5	µg/m <sup>3</sup>	microgram(s) per cubic meter
6	325 FW	325th Fighter Wing
7	33 FW	33rd Fighter Wing
8	96 CEG/CEIEC	96th Civil Engineer Group/Environmental Compliance
9	96 LRS	96th Logistics Readiness Squadron
10	96 MXS	96th Maintenance Squadron
11	96 TW	96th Test Wing
12	ac	acre(s)
13	ACAM	Air Conformity Applicability Model
14	ACC	Air Combat Command
15	ACM	asbestos-containing materials
16	ADAIR	adversary air
17	AETC	Air Education and Training Command
18	AFB	Air Force Base
19	AFCEC	Air Force Civil Engineer Center
20	AFI	Air Force Instruction
21	AFMAN	Air Force Manual
22	AFOSH	Air Force Occupational Safety and Health
23	AFPD	Air Force Policy Directive
24	AGE	Aerospace Ground Equipment
25	AGL	above ground level
26	AGRS	aggressor squadron
27	AICUZ	Air Installation Compatible Use Zone
28	Air Force	United States Air Force
29	AMU	Aircraft Maintenance Unit
30	AOC	area of concern
31	APE	Area of Potential Effects
32	APZ	Accident Potential Zone
33	AQCR	Air Quality Control Region
34	AST	aboveground storage tank
35	ATC	Air Traffic Control
36	ATCAA	Air Traffic Control Assigned Airspace
37	BASH	bird/wildlife-aircraft strike hazard
38	BRAC	Base Realignment and Closure
39	CAA	Clean Air Act
40	CAD	cartridge-actuated device
41	CAF	Combat Air Forces
42	CDDAR	Crash Damaged or Disabled Aircraft Recovery
43	CDNL	C-weighted Day-Night Average Sound Level
44	CEQ	Council on Environmental Quality
45	CFR	Code of Federal Regulations
46	CO	carbon monoxide
47	CO <sub>2</sub>	carbon dioxide
48	CO <sub>2</sub> e	carbon dioxide equivalent
49	CSEL	C-Weighted Sound Exposure Level
50	CZ	clear zone
51	CZMA	Coastal Zone Management Act
52	dB	decibel(s)
53	dBA	A-weighted decibel(s)
54	DNL	Day-Night Average Sound Level
55	DOD	Department of Defense
56	DPS	distinct population segment

1	E	endangered
2		<b>LIST OF ACRONYMS AND ABBREVIATIONS</b>
3		
4	EA	Environmental Assessment
5	EGTTR	Eglin Gulf Test and Training Range
6	EIAP	Environmental Impact Analysis Process
7	EIS	Environmental Impact Statement
8	EMR	electromagnetic radiation
9	EO	Executive Order
10	ERP	Environmental Restoration Program
11	ESA	Endangered Species Act
12	ESOHC	Environmental Safety and Occupational Health Council
13	EUL	Enhanced Use Lease
14	FAA	Federal Aviation Administration
15	FDEP	Florida Department of Environmental Protection
16	FL	Flight Level
17	FONSI	Finding of No Significant Impact
18	ft	foot(feet)
19	ft <sup>2</sup>	square foot(feet)
20	FTU	formal training unit
21	FWC	Florida Fish and Wildlife Conservation Commission
22	GHG	greenhouse gas
23	GWP	global warming potential
24	HAZMAT	hazardous material(s)
25	IDP	Installation Development Plan
26	IFR	Instrument Flight Rules
27	in.	inch(es)
28	INRMP	Integrated Natural Resources Management Plan
29	IRP	Installation Restoration Program
30	LBP	lead-based paint
31	L <sub>dn</sub>	Day-Night Average Sound Level
32	L <sub>dnmr</sub>	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
33	L <sub>eq</sub>	Equivalent Sound Level
34	L <sub>max</sub>	Maximum Sound Level
35	LTO	landing and takeoff
36	MBTA	Migratory Bird Treaty Act
37	mg/m <sup>3</sup>	milligram(s) per cubic meter
38	mi	mile(s)
39	mi <sup>2</sup>	square mile(s)
40	MMPA	Marine Mammal Protection Act
41	MOA	Military Operations Area
42	MOU	Memorandum of Understanding
43	mph	mile(s) per hour
44	MSL	mean sea level
45	N/A	not applicable
46	NAAQS	National Ambient Air Quality Standards
47	NAGPRA	Native American Graves Protection and Repatriation Act
48	NASA	National Aeronautics and Space Administration
49	NEPA	National Environmental Policy Act
50	NH <sub>3</sub>	ammonia
51	NHPA	National Historic Preservation Act
52	NM	nautical mile(s)
53	NMFS	National Marine Fisheries Service
54	NO <sub>2</sub>	nitrogen dioxide
55	NOAA	National Oceanic and Atmospheric Administration
56	NO <sub>x</sub>	nitrogen oxides

## LIST OF ACRONYMS AND ABBREVIATIONS

1		
2		
3	NRHP	National Register of Historic Places
4	O <sub>3</sub>	ozone
5	OSHA	Occupational Safety and Health Administration
6	PA	Programmatic Agreement
7	PAD	propellant-actuated device
8	Pb	lead
9	PCB	polychlorinated biphenyl
10	pCi/L	picocurie(s) per liter
11	PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 microns in diameter
12	PM <sub>10</sub>	particulate matter equal to or less than 10 microns in diameter
13	POI	point of interest
14	ppb	part(s) per billion
15	ppm	part(s) per million
16	PSD	Prevention of Significant Deterioration
17	psf	pound(s) per square foot
18	PWS	<i>Performance Work Statement for the Combat Air Forces (CAF) Contracted Air Support (CAF CAS)</i>
19		
20	Q-D	quantity-distance
21	RCW	red-cockaded woodpecker
22	ROD	Record of Decision
23	ROI	Region of Influence
24	RONA	Record of Nonapplicability
25	SAC	Strategic Air Command
26	SCH	State Clearinghouse
27	SEIS	Supplemental Environmental Impact Statement
28	SEL	Sound Exposure Level
29	SHPO	State Historic Preservation Office
30	SIP	State Implementation Plan
31	SO <sub>2</sub>	sulfur dioxide
32	SO <sub>x</sub>	sulfur oxides
33	SVE	Soil Vapor Extraction
34	T	threatened
35	T&E	threatened and endangered
36	TCE	trichloroethene
37	TGO	touch and go
38	tpy	ton(s) per year
39	TSCA	Toxic Substances Control Act
40	U.S.C.	United States Code
41	US	United States
42	USEPA	United States Environmental Protection Agency
43	USFWS	United States Fish and Wildlife Service
44	USSG	United States Surgeon General
45	UST	underground storage tank
46	VFR	Visual Flight Rules
47	VOC	volatile organic compound
48	yd <sup>2</sup>	square yard(s)
49		

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## CHAPTER 1 PURPOSE AND NEED FOR ACTION

### 1.1 INTRODUCTION

The United States Air Force (Air Force) is tasked with the defense of the United States (US) and fulfillment of its Title 10 United States Code (U.S.C.) mission. The Air Force's mission is to fly, fight, and win - in air, space, and cyberspace. In order to accomplish this mission, it is critical that combat pilots, and the Airmen supporting them, adequately train to attain proficiency on tasks they must execute during times of war and further to sustain this proficiency as they serve in the Air Force. Increasingly, fighter pilots of the Combat Air Forces (CAF) have been operating at degraded levels of proficiency and training readiness due to diminishing fiscal resources. For the purpose of this effort, the CAF includes all active duty, Air National Guard, and Air Force Reserve units in both operational units and formal training units (FTUs).

Ideally, CAF fighter pilots would be able to maintain their proficiency by flying 200 or more hours per year, practicing training syllabus tasks, tactics, and procedures. Unfortunately, for much of the last decade, pilots of advanced weapons platforms have been falling 25 to 40 percent short of the flying hours recommended to build and sustain their proficiency on required training tasks (Venable, 2016). At the same time, increasingly complex aircraft and technologies require more time to master the full range of skills required to become proficient combat-ready pilots. Along with insufficient budgets to support the flying hours/training requirements needed by CAF pilots, they have also had to support adversary air (ADAIR) flying missions that have minimal training value to the CAF pilots themselves. ADAIR missions simulate an opposing force that provides a necessary and realistic combat environment during CAF training missions. Flying these ADAIR sorties requires the use of potential adversaries' tactics and procedures that may differ significantly from CAF tactics and procedures and therefore provides minimal CAF training while taking up valuable flying hours that could otherwise be spent on core training tasks. In many cases, minimal ADAIR, or none at all, has been available to support pilot training and has resulted in degraded readiness for CAF pilots who are expected to operate some of the most sophisticated weapons platforms in the world.

A SORTIE IS DEFINED AS A SINGLE MILITARY AIRCRAFT FLIGHT FROM INITIAL TAKEOFF THROUGH FINAL LANDING.

During his confirmation hearing, Chief of Staff of the Air Force, General David Goldfein, identified a growing crisis in the readiness of CAF pilots (Venable, 2016):

*Less than half of Air Force combat units are ready for "full-spectrum" (high threat, high intensity) combat. This lack of readiness could jeopardize the lives of aircrews and other service members who depend upon them in combat and put mission-essential tasks at great risk.*

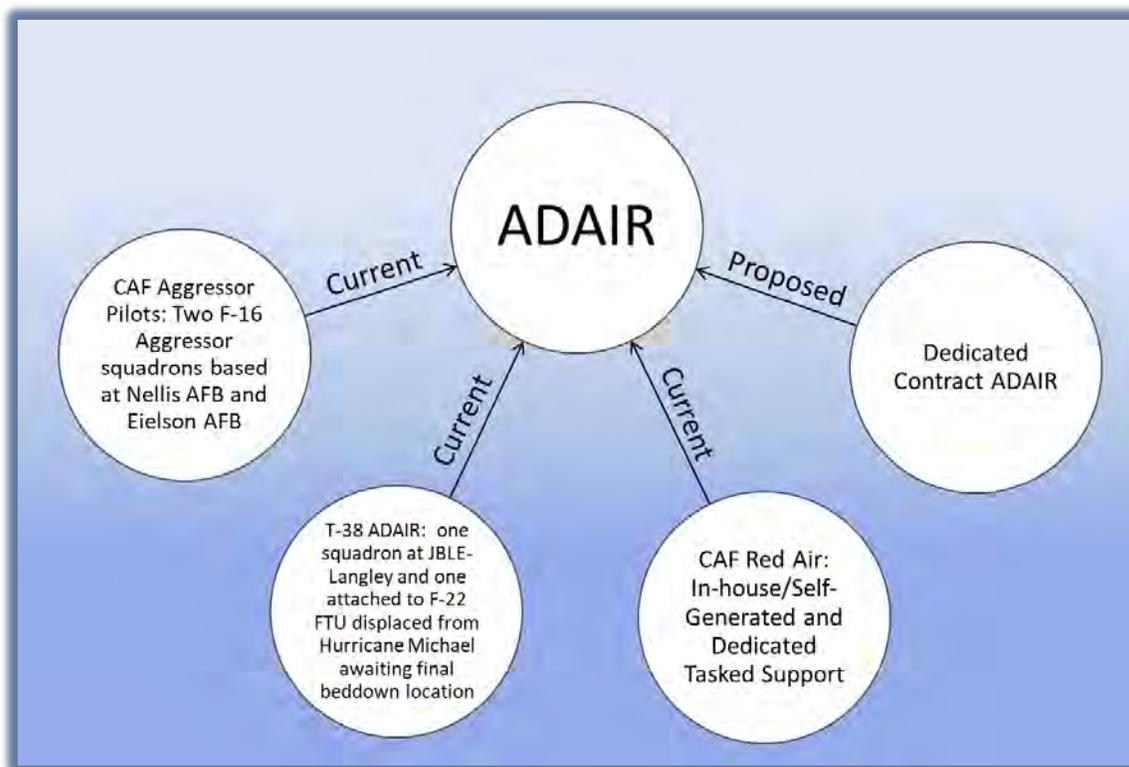
#### 1.1.1 Background

Air Force readiness is currently affected by several issues including training, weapon system sustainment, and facilities. While all are critical, training in particular has become an increasing concern as worldwide commitments, high operations tempo, and fiscal and manpower limitations detract from available training resources. As an example, the Budget Control Act of 2011, as implemented in 2013, reduced flying hours by 18 percent and temporarily stood down 17 of 40 combat-coded squadrons (The Heritage Foundation, 2015). The Air Force prioritized readiness in 2014, but shortfalls in readiness were not eliminated and have persisted through the present day as indicated by the Chief of Staff of the Air Force's acknowledgement of the lack of readiness in more than half of the service's combat units. In the training arena, readiness issues are manifested by multiple issues such as 1) an inability to internally support ADAIR without a corresponding sacrifice in scarce flying hours and normal training objectives; 2) a lack of advanced threat aircraft to provide representative ADAIR for realistic training; 3) a fighter pilot manning crisis, necessitating increased pilot production beyond sustainable levels; and 4) granting excessive syllabus waivers to graduates of the Air Force Weapons School due to inadequate ADAIR support during final training phases.

1 Lack of available ADAIR is degrading levels of pilot readiness and contributing to the overall decline in  
2 availability of proficient CAF pilots. The arrangement in which CAF ADAIR sorties are currently organized  
3 is depicted on **Figure 1-1**. At present, the current approach meets less than 50 percent of the total ADAIR  
4 requirement across the Air Force.

5  
6 Self-generated ADAIR can either be “in-house” supporting daily flying schedules or via a dedicated tasking  
7 to support an external unit, both referred to as “Red Air.” In both the “in-house” and “dedicated” options,  
8 performing self-generated ADAIR is at the expense of the tasked units’ normal Air Force training objectives.  
9 These two options still result in an ADAIR capacity of less than 50 percent of the Air Force-wide requirement  
10 and reduce the availability and proficiency of combat qualified pilots at a time when the Air Force is  
11 experiencing a shortfall of more than 750 CAF pilots (Venable, 2016). Furthermore, current dedicated  
12 ADAIR units in the Air Force consist of two F-16 aggressor squadrons (AGRSs) and two T-38 fighter training  
13 squadrons. The F-16 aircraft used for aggressor missions is an advanced weapons platform, but there are  
14 not enough to meet the ADAIR requirements to maintain proficiency of the CAF’s pilots. The T-38 is used  
15 for ADAIR but is a basic platform with no advanced electronics (radar and avionics) or weapons capabilities  
16 and does not adequately replicate realistic threat capabilities. In both the F-16 AGRS and T-38 ADAIR  
17 cases, the number of available aircraft and pilots are insufficient to meet the requirement.

18  
19 As depicted on **Figure 1-1**, contract ADAIR would provide a fourth avenue to fill ADAIR sorties and improve  
20 the quality of training and readiness of CAF pilots and allow the Air Force to recapitalize other valuable  
21 assets and training time.  
22  
23



24  
25 **Figure 1-1. Current and Proposed Adversary Air Sortie Generation.**  
26  
27

28 The contract ADAIR requirement is roughly 30,000 annual sorties. The Air Force would implement contract  
29 ADAIR in support of installations that host specific critical air-to-air training missions. Installations requiring  
30 contract ADAIR support include those bases hosting Air Force 5th generation fighter units (e.g., F-22 or  
31 F-35 aircraft), fighter FTUs, or those that support advanced fighter training. Air Force requirements for

1 contract ADAIR exist currently at multiple locations within the continental United States and Joint Base  
2 Pearl Harbor-Hickam, Hawaii.

3  
4 As discussed in **Section 1.3**, the scope of this analysis will evaluate the proposal to implement contract  
5 ADAIR in support of Eglin Air Force Base (AFB) from Tyndall AFB. The contract ADAIR operation would  
6 be bedded down temporarily (up to 24 months) at Tyndall AFB. Separate NEPA analyses will be completed  
7 at all locations identified by the Air Force that require contract ADAIR support and have sufficient existing  
8 facilities. This analysis will evaluate the use of Tyndall AFB and the airspace that would be utilized in  
9 support of Eglin AFB.

### 10 11 1.1.2 Location

12  
13 Tyndall AFB is located in the Florida panhandle in Bay County on a peninsula between the St. Andrew  
14 Bay system and the Gulf of Mexico (**Figure 1-2**). The base is about 13 miles (mi) southeast of Panama  
15 City and is divided by US Highway 98 (**Figure 1-3**).

16  
17 Tyndall AFB is home to the 325th Fighter Wing (325 FW) and  
18 falls under the Air Combat Command (ACC). The 325 FW  
19 supports operations of advanced 5th generation aircraft. Prior  
20 to the landfall of Hurricane Michael (see Section 1.1.3) on 10  
21 October 2018, the 325 FW included the 43d Fighter Squadron  
22 (43 FS), which trained F-22 pilots, and the 95th Fighter  
23 Squadron (95 FS), which was an operational F-22 unit. The 2d  
24 Fighter Training Squadron provides ADAIR training using the  
25 T-38. Tyndall AFB also hosts multiple other units including the  
26 1st Air Force, Air Force Civil Engineer Center (AFCEC), and  
27 53d Weapons Evaluation Group.

28  
29 CAF training activities utilize special use airspace proximate to  
30 Eglin and Tyndall AFB. Special use airspace includes Warning  
31 Areas, Military Operations Areas (MOAs), and Air Traffic  
32 Control Assigned Airspace (ATCAA), which provide airspace  
33 for military aircraft training and serve to warn nonparticipating  
34 aircraft of potential danger. Eglin AFB manages and controls  
35 Warning Areas W-151 and W-470, the Rose Hill MOA, the  
36 Eglin E MOA, and the associated ATCAAs which are within the  
37 same lateral confines as the MOAs proposed for contract  
38 ADAIR use (**Figure 1-4**). Tyndall AFB manages and controls  
39 Tyndall B, C/H, and E MOAs and the Compass Lake and  
40 Carrabelle ATCAAs located within the same lateral confines as  
41 the Tyndall MOAs (**Figure 1-5**).

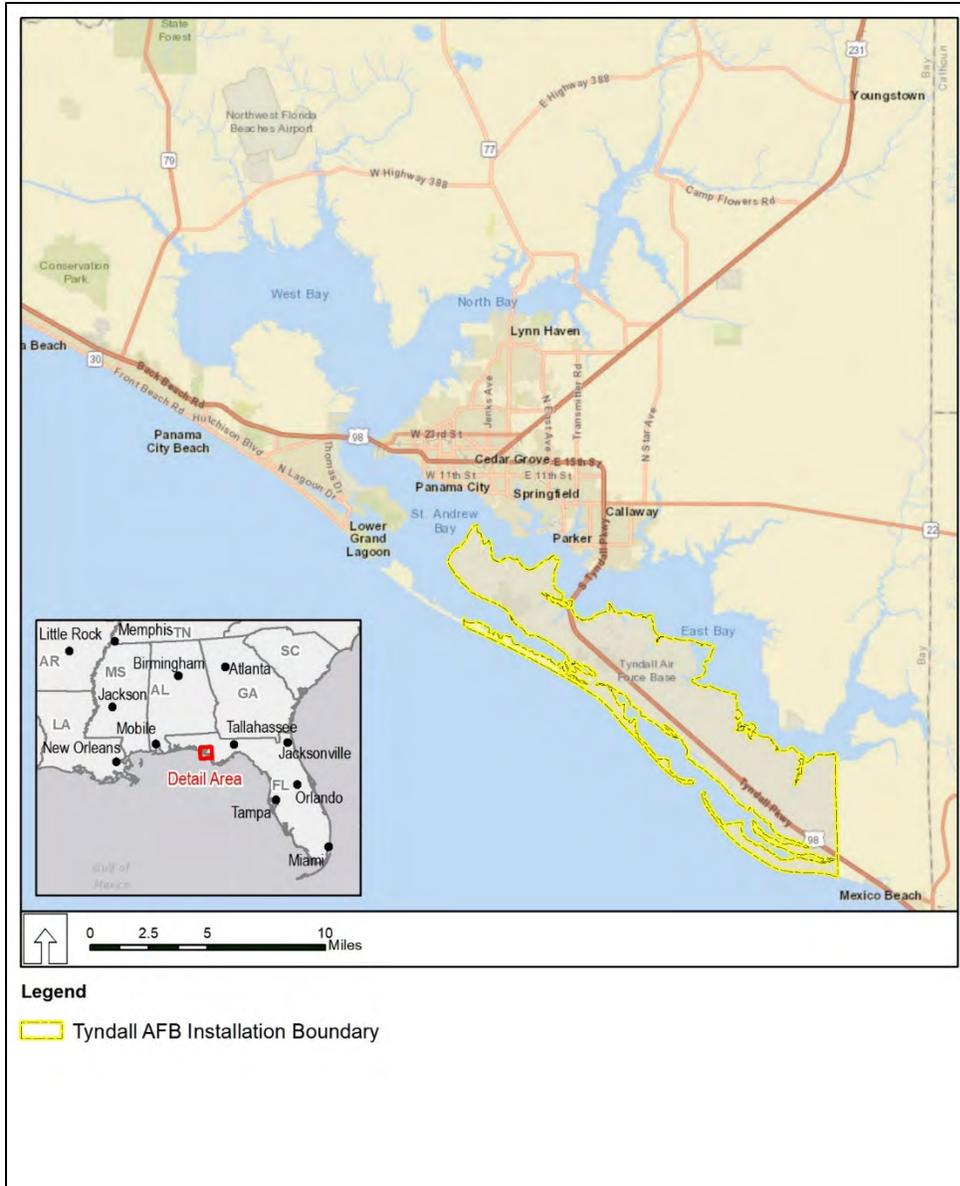
42  
43 Tyndall AFB and the surrounding military airspace provide a  
44 critical venue for the Air Force to train pilots

A MILITARY OPERATIONS AREA (MOA) IS DESIGNATED AIRSPACE OUTSIDE OF CLASS A AIRSPACE TO SEPARATE OR SEGREGATE CERTAIN NONHAZARDOUS MILITARY ACTIVITIES FROM INSTRUMENT FLIGHT RULES (IFR) TRAFFIC. ACTIVITIES IN MOAs INCLUDE, BUT ARE NOT LIMITED TO, AIR COMBAT MANEUVERS, AIR INTERCEPTS, AND LOW ALTITUDE TACTICS. THE DEFINED VERTICAL AND LATERAL LIMITS VARY FOR EACH MOA. WHILE MOAs GENERALLY EXTEND FROM 1,200 FEET (FT) ABOVE GROUND LEVEL (AGL) TO 18,000 FT ABOVE MEAN SEA LEVEL (MSL), THE FLOOR MAY EXTEND BELOW 1,200 FT AGL IF THERE IS A MISSION REQUIREMENT AND THERE IS MINIMAL ADVERSE AERONAUTICAL EFFECT.

CLASS A AIRSPACE IS CONTROLLED AIRSPACE OF DEFINED DIMENSIONS WITHIN WHICH AIR TRAFFIC CONTROL SERVICE IS PROVIDED AND ALL OPERATIONS MUST OCCUR UNDER IFR. CLASS A AIRSPACE IS GENERALLY FROM 18,000 FT MSL UP TO AND INCLUDING 60,000 FT MSL AND INCLUDES AIRSPACE OVERLYING WATERS WITHIN 12 NAUTICAL MILES (NM) OF THE COAST OF THE 48 CONTIGUOUS UNITED STATES (US) AND ALASKA.

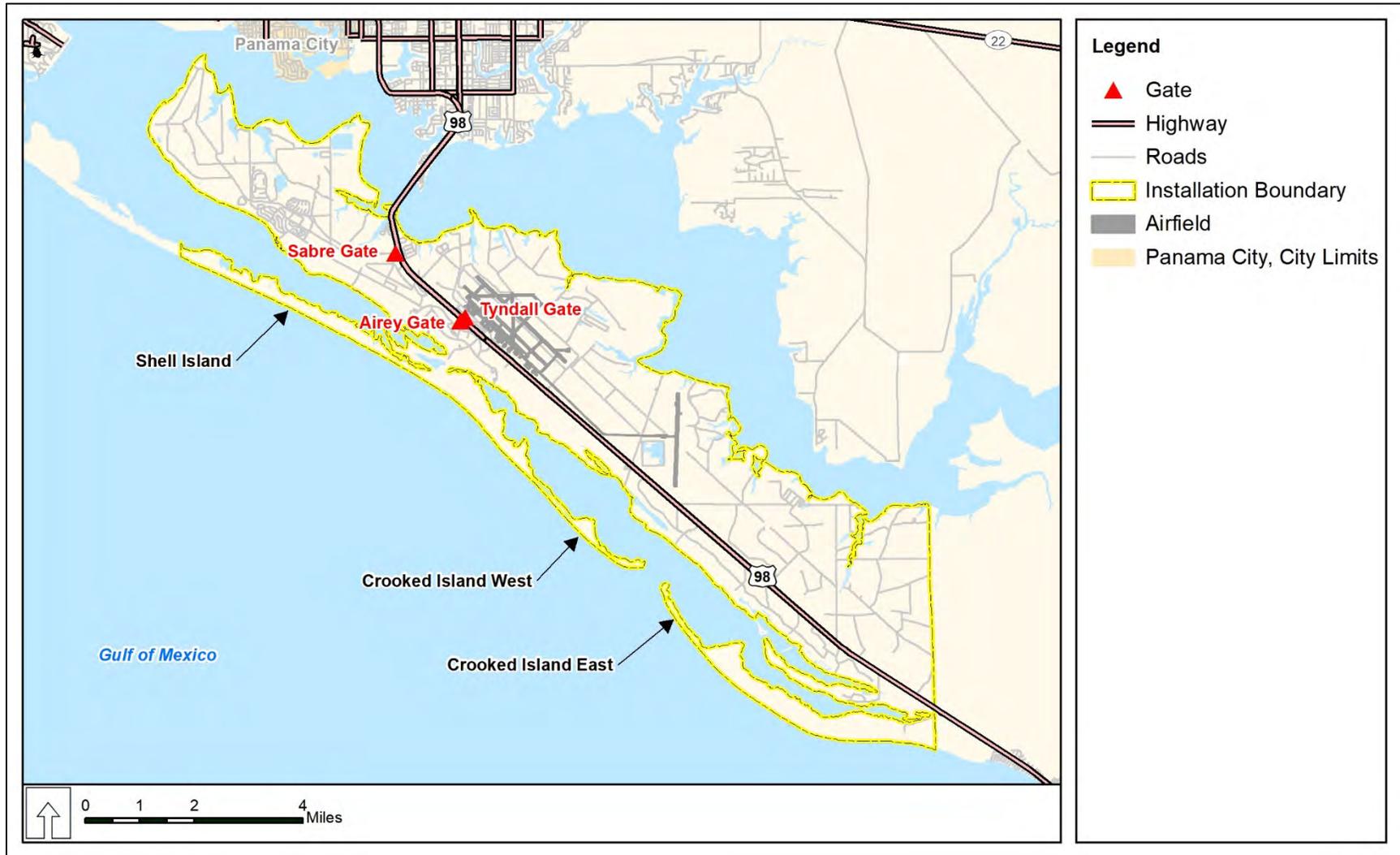
AIR TRAFFIC CONTROL ASSIGNED AIRSPACE (ATCAA) IS ASSIGNED TO AIR TRAFFIC CONTROL TO SEGREGATE AIR TRAFFIC BETWEEN SPECIFIED ACTIVITIES BEING CONDUCTED WITHIN THE ASSIGNED AIRSPACE AND OTHER IFR TRAFFIC. ATCAA IS THE EQUIVALENT OF A MOA AT 18,000 FT MSL AND ABOVE. THIS AIRSPACE IS NOT DEPICTED ON ANY CHART BUT IS OFTEN AN EXTENSION OF A MOA TO HIGHER ALTITUDES AND USUALLY REFERRED TO BY THE SAME NAME. THIS AIRSPACE REMAINS UNDER CONTROL OF THE FEDERAL AVIATION ADMINISTRATION (FAA) WHEN NOT IN USE TO SUPPORT GENERAL AVIATION ACTIVITIES.

A WARNING AREA IS AN AIRSPACE OF DEFINED DIMENSIONS THAT EXTENDS FROM 3 NM OUTWARD FROM THE COAST OF THE UNITED STATES AND MAY BE OVER US WATERS, INTERNATIONAL WATERS, OR BOTH. THE PURPOSE OF WARNING AREAS IS TO WARN NONPARTICIPATING PILOTS OF POTENTIALLY HAZARDOUS ACTIVITY. WARNING AREAS MAY BE USED FOR OTHER PURPOSES IF RELEASED TO THE FAA DURING PERIODS WHEN NOT REQUIRED FOR THEIR INTENDED PURPOSE AND ARE WITHIN AREAS IN WHICH THE FAA HAS AIR TRAFFIC CONTROL AUTHORITY.



1  
2 **Figure 1-2. Regional Location of Tyndall Air Force Base.**

1



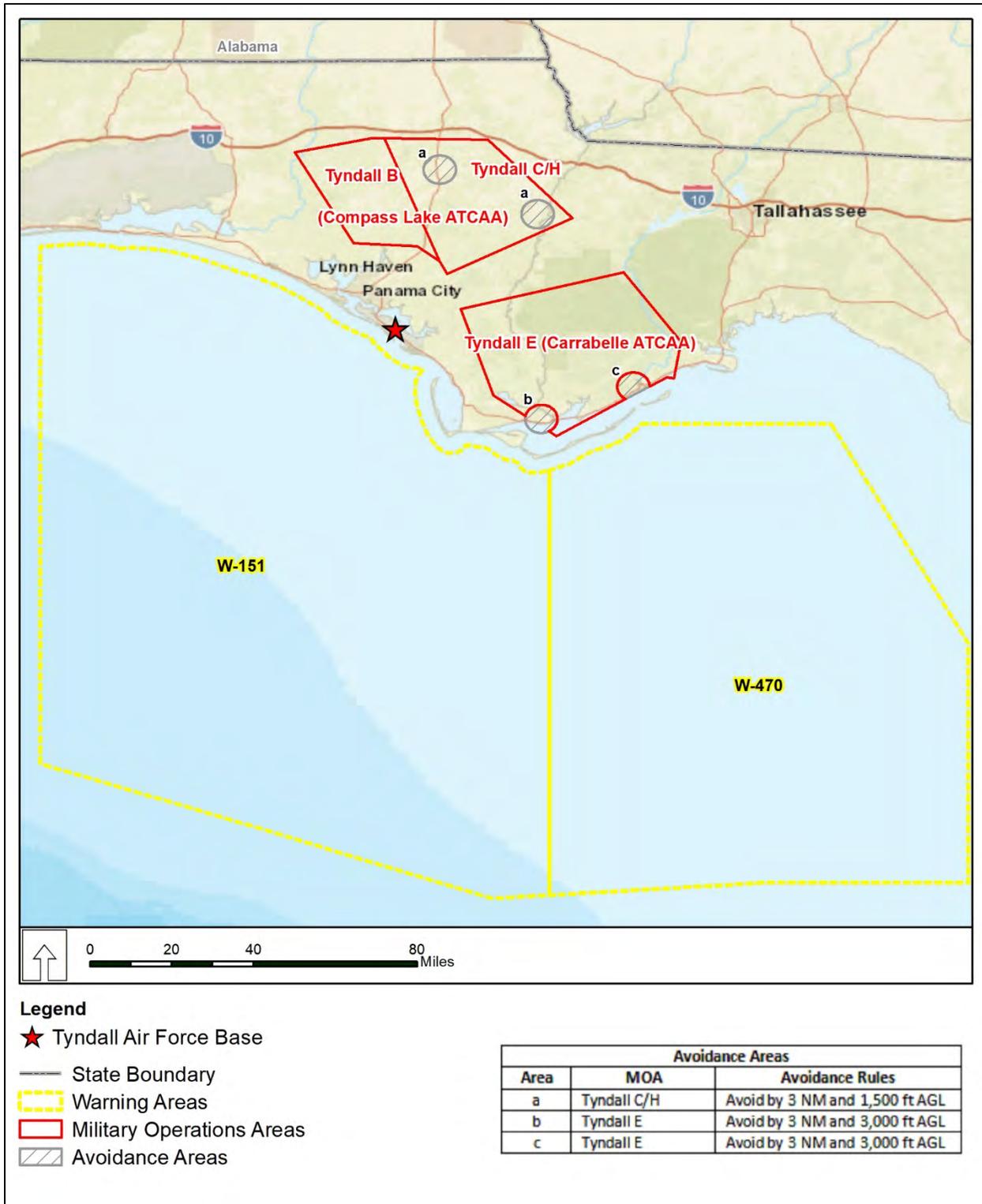
2  
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Figure 1-3. Location of Tyndall Air Force Base.



1  
2  
3  
4  
5  
6

**Figure 1-4. Warning Area and Military Operations Areas Proposed for Contract Adversary Air Sorties Promixate to Eglin AFB. The Rose Hill and Eglin E ATCAAs are Within the Same Lateral Confines as the Military Operations Areas Proposed for Contract Adversary Air Use.**



1  
2  
3  
4  
5  
Figure 1-5 Warning Area and Military Operations Areas Proposed for Contract Adversary Air Sorties Promixate to Tyndall AFB. The Lake and Carrabelle ATCAAs are Within the Same Lateral Confines as the Military Operations Areas Proposed for Contract Adversary Air Use

1 1.1.3 *Effects of Hurricane Michael*

2  
3 1.1.3.1 Storm Description

4  
5 Hurricane Michael formed as a weak Caribbean tropical system on 6 October 2018 (National Weather  
6 Service, 2019). When it entered the Gulf of Mexico, it rapidly gained strength, and within 48 hours, it had  
7 intensified to a Category 5 hurricane. Hurricane Michael made landfall in the Florida Panhandle between  
8 Tyndall AFB and Mexico Beach on 10 October 2018 at 1:00 p.m. Hurricane Michael was the third most  
9 intense hurricane to make landfall in the contiguous United States based on pressure and the fourth most  
10 intense based on wind speed (National Centers for Environmental Information, 2019). After making landfall,  
11 the hurricane tracked northeast into southwestern Georgia and dissipated across the east coast on  
12 11 October 2018 (National Weather Service, 2019).

13  
14 1.1.3.2 Conditions Experienced at Tyndall Air Force Base

15  
16 Hurricane Michael was the most powerful recorded storm to impact the Florida Panhandle. The eye of the  
17 hurricane passed directly over Tyndall AFB, which is located near Panama City, Florida, approximately  
18 85 miles (mi) east of Eglin AFB. Wind gusts on Tyndall AFB of up to 139 miles per hour (mph) were recorded  
19 before the transmission tower toppled while the maximum sustained winds recorded in surrounding areas  
20 reached 155 mph. Total rainfall for Tyndall AFB was 2.5 to 3.0 inches, and the reported storm surge  
21 southeast of Tyndall AFB, from Mexico Beach to Indian Pass, reached 9 to 14 feet (ft).

22  
23 1.1.3.3 Impact on Tyndall Air Force Base

24  
25 All 484 structures on Tyndall AFB sustained roof or other structural damages. Water, power, and sewer  
26 services were unavailable for several weeks (Holton, 2019). Flightline and support facilities, the drone  
27 runway, elementary school, and multiple other buildings sustained severe to catastrophic damage  
28 (Dickstein and Kenney, 2018). Recovery and rebuilding efforts are expected to take several years and will  
29 include demolition, repair, and construction of new facilities. Tyndall AFB is expected to return to full  
30 operational status and as facilities become available, aircraft are expected to be assigned to the 325th  
31 Fighter Wing (325 FW) as directed by the Secretary of the Air Force.

32  
33 1.1.3.4 Implications for Tyndall Air Force Base and Eglin Air Force Base

34  
35 As a result of the catastrophic damage done to Tyndall AFB, operational units have been temporarily  
36 relocated to other Air Force bases. The F-22s assigned to the 95th Fighter Squadron have all been  
37 reassigned to other operational F-22 units. The F-22 FTU (43rd Fighter Squadron) and its supporting T-38s  
38 of the 2nd Fighter Training Squadron are now temporarily located at Eglin AFB and began limited F-22  
39 training in December 2018. A Special Environmental Assessment (EA) was completed for the interim  
40 beddown of the F-22 FTU and T-38s at Eglin AFB in order to resume the F-22 pilot training course (Air  
41 Force, 2019). The Air Force intends to prepare an Environmental Impact Statement (EIS) for the F-22 FTU  
42 and supporting T-38 permanent beddown that will include the assessment of reasonable alternatives (84  
43 Federal Register 11289).

44  
45 1.2 PURPOSE OF THE ACTION

46  
47 The purpose of the Proposed Action is to provide dedicated contract ADAIR sorties to improve the quality  
48 of training and readiness of pilots of the 33 FW and 325 FW at Eglin AFB, Florida. As a shared resource,  
49 other units assigned to Eglin AFB such as the 96 TW and 53rd Wing may use contract ADAIR to support  
50 activities provided they are legitimate training requirements (e.g., a large force exercise undertaken to allow  
51 aircrews to train alongside other aircraft, providing realistic training scenarios involving multi-aircraft  
52 operations). The contract ADAIR support would employ adversary tactics across the training spectrum from  
53 basic fighter maneuvers to higher-end, advanced, simulated, combat training missions. The objective of the  
54 Proposed Action for Eglin AFB is to increase the quality of training for 5th generation F-35 and F-22 fighter

1 pilots by filling the “near peer” capacity and capability  
2 gap currently present in the 5th generation training  
3 enterprise. Additionally, other Air Force (4th generation)  
4 units that may have been tasked to provide ADAIR  
5 training support at Eglin AFB may now recapitalize  
6 valuable flying hours to focus on increasing their own  
7 levels of proficiency and readiness.

FIFTH (5TH) GENERATION IS A TERM APPLIED TO THE NEWEST WEAPONS SYSTEMS SUCH AS THE F-22 AND F-35 FIGHTERS THAT CONTAIN NEW AND ENHANCED LEVELS OF STEALTH PROFILES, SPEED, MANEUVERABILITY, AND ADVANCED AVIONICS AND ATTACK CAPABILITIES. FOURTH (4TH) GENERATION AIRCRAFT ARE THE PREVIOUS SUITE OF FIGHTERS SUCH AS F-15, F-16, AND F/A-18.

### 10 1.3 NEED FOR THE ACTION

11  
12 The need for the action is to provide better and more realistic training for the F-35 and F-22 flight training  
13 programs at Eglin AFB. Dedicated contract ADAIR is critical to improving pilot readiness as it provides realistic  
14 training opportunities to employ CAF tactics and procedures that optimize the training value of every mission.  
15 Contract ADAIR can be used in basic building block syllabus sorties or the very advanced and fluid environment  
16 of multi-aircraft air combat required by the training syllabus. Eglin AFB does not have the existing capacity to  
17 host the ADAIR mission from its flightline. Due to the near-term need for ADAIR training, a suitable location  
18 with existing facilities and access to the Eglin Gulf Test and Training Range is required for ADAIR operations  
19 to support the 33<sup>rd</sup> and 325<sup>th</sup> Fighter Wings.

### 22 1.4 SCOPE OF THE ENVIRONMENTAL ANALYSIS

23  
24 This EA analyzes the potential environmental consequences associated with temporarily establishing  
25 dedicated contract ADAIR support at Tyndall AFB. The Air Force proposes to locate contract ADAIR at Tyndall  
26 AFB temporarily for up to 24 months to support the 33<sup>rd</sup> and 325<sup>th</sup> Fighter Wings. Contract ADAIR support  
27 would employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end,  
28 advanced, simulated, combat training missions in order to increase the quality of training for F-35 and F-22  
29 fighter pilots.

30  
31 This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 U.S.C.  
32 §§ 4321 through 4347), the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal  
33 Regulations [CFR] Part 1500 to 1508), and 32 CFR Part 989 et seq., *Environmental Impact Analysis  
34 Process (EIAP)*. NEPA is the basic national requirement for identifying environmental consequences of  
35 federal decisions. NEPA ensures that environmental information, including the anticipated environmental  
36 consequences of a proposed action, is available to the public, federal and state agencies, and the decision-  
37 maker before decisions are made and before actions are taken.

38  
39 Consistent with the CEQ regulations, the EA is organized into the following sections:

- 40 • Chapter 1, Purpose and Need for Action, includes an introduction, background description, location,  
41 purpose and need statement, scope of environmental analysis, decision to be made, interagency  
42 and intergovernmental coordination and consultations, applicable laws and environmental  
43 regulations, and a description of public and agency review of the EA.
- 44 • Chapter 2, Description of the Proposed Action and Alternatives, includes a description of the  
45 Proposed Action, alternative selection standards, screening of alternatives, alternatives  
46 eliminated from further consideration, a description of the selected alternatives, and summary of  
47 potential environmental consequences.
- 48 • Chapter 3, Affected Environment, includes a description of the natural and man-made  
49 environments within and surrounding Eglin AFB and the airspace that may be affected by the  
50 Proposed Action and alternatives.
- 51 • Chapter 4, Environmental Consequences, includes definitions and discussions of direct and  
52 indirect impacts and best management practices, if applicable.
- 53 • Chapter 5, Cumulative Effects, considers the potential cumulative impacts on the environment that  
54 may result from the incremental impact of the Proposed Action when added to other past,  
55 present, and reasonably foreseeable future actions.

- Chapter 6, List of Preparers, provides a list of the preparers of this EA.
- Chapter 7, References, contains references for studies, data, and other resources used in the preparation of the EA.
- Appendices, as required, provide relevant correspondence, studies, modeling results, and public review information. **Appendix A** includes all interagency and intergovernmental coordination and consultations; **Appendix B** provides noise metrics and noise models; **Appendix C** outlines methodologies, emission factors, and assumptions used for air quality emission estimates for each scenario and related activities; and **Appendix D** summarizes the listed species potentially occurring in the action area.

NEPA, which is implemented through the CEQ regulations, requires federal agencies to consider alternatives to the Proposed Action and to analyze potential impacts of alternative actions. Potential impacts of the Proposed Action and its alternatives described in this document will be assessed in accordance with the Air Force EIAP (32 CFR Part 989), which requires that impacts on resources be analyzed in terms of their context, duration, and intensity. To help the public and decision makers understand the implications of impacts, they will be described in the short and long term, cumulatively, and within context. Environmental resources and the Region of Influence (ROI) analyzed in the EA are summarized in **Table 1-1**. The expected geographic scope of any potential consequences is identified as the ROI. Tyndall AFB and its environs, as well as the area under the proposed airspace are considered in determining the ROI for each resource. As indicated in **Table 1-1**, Socioeconomics – Income and Employment; Environmental Justice and Protection of Children; and Hazardous Materials and Wastes, Toxic Substances, and Contaminated Sites are not described in the airspace ROI for baseline in **Chapter 3** or considered for detailed analysis in **Chapter 4**. No construction or development is proposed under the airspace, so no impacts on these resources would occur under the airspace

**Table 1-1. Environmental Resources Analyzed in the Environmental Assessment**

Resource	Region of Influence: Tyndall AFB and environs	Region of Influence: Warning Areas W-151 and W-470; Rose Hill, Eglin E, Tyndall B, C/H and E MOAs
Airspace Management and Use	✓	✓
Noise	✓	✓
Safety	✓	✓
Air Quality	✓	✓
Biological Resources (Threatened and Endangered Species, Marine Resources)	✓	✓
Cultural Resources (Archeological, Architectural, Traditional)	✓	✓
Hazardous Materials and Wastes, Toxic Substances, and Contaminated Sites	✓	

Notes:  
AFB = Air Force Base; MOA = Military Operating Area

1 1.4.1 *Resource Areas Eliminated from Detailed Analysis*  
2

3 No public or agency concerns were raised as a result of Interagency/Intergovernmental Coordination for  
4 Environmental Planning, and the Proposed Action is not expected to affect the following resources;  
5 therefore, they are not carried forward for detailed analysis.  
6

7 1.4.1.1 Infrastructure, Transportation, and Utilities  
8

9 During site selection, the support for contract ADAIR operations was determined to be adequate for facilities  
10 and communication infrastructure at Tyndall AFB. No new construction or infrastructure changes would  
11 occur under the Proposed Action. The level of service for utilities needed to support the contract personnel  
12 is assumed to be the same under all alternatives and would be adequate to support the Proposed Action.  
13 Because there would only be an additional 93 contract personnel working at Tyndall AFB to support the  
14 contract ADAIR operations and adequate infrastructure, transportation network, and base access gate  
15 capacity exist on base to support these personnel and contract ADAIR aircraft operations, there would be  
16 no impacts on infrastructure, transportation, and utilities at Tyndall AFB; therefore, these resources are not  
17 carried forward for further detailed analysis in this EA.  
18

19 1.4.1.2 Socioeconomics  
20

21 The requirement for an estimated 93 contract personnel and their families supporting the contract ADAIR  
22 sorties in the Panama City, Florida, region was considered as the population and housing in the region has  
23 been greatly impacted by Hurricane Michael; however, the additional personnel would have no impact on  
24 the region's population. Even assuming all 93 contract personnel relocated with family members to Bay  
25 County, this would be a potentially negligible increase in the County's population of nearly 169,000 people.  
26 Following Hurricane Michael, housing availability in the region is limited both due to the infrastructure  
27 damage as well as the high demand on housing from construction workers and contract ADAIR would be  
28 implemented prior to the full reconstruction of Tyndall AFB. Regionally damaged housing and schools  
29 continue to be rebuilt ; therefore, there would be short-term, minor impacts of the Proposed Action on the  
30 local or regional population, housing, or schools.  
31

32 Since there is no new construction proposed at Tyndall AFB, potential interior upgrades to facilities for  
33 contract ADAIR operations would require only a small amount of supplies and labor and therefore, would  
34 not impact the existing socioeconomic environment. The 93 contracted ADAIR maintenance personnel and  
35 pilots would represent a small increase in the over 4,200 military and civilian personnel currently employed  
36 at Tyndall AFB; therefore, no adverse impact on socioeconomics – income and employment would occur.  
37 An estimated annual increase in expenditures of approximately \$51 million for contract ADAIR at Tyndall  
38 AFB would have a potential major, beneficial, long-term impact.  
39

40 1.4.1.3 Land Use

41 There would be no short-term changes to the existing land use or noise environment at Tyndall AFB or land  
42 uses under the MOAs. Contract ADAIR sorties would only occur in the special use airspace where military  
43 aircraft training already occurs. Therefore, contract ADAIR operations would not impact Land Use.  
44

45 1.4.1.4 Environmental Justice and Protection of Children

46 Under the Proposed Action, the increase in the number of personnel at Tyndall AFB supporting the contract  
47 ADAIR would be temporary and would not result in a disproportionate impact on minorities, low-income  
48 populations, and protection of children. The 93 additional personnel and their families supporting the  
49 contract ADAIR requirement would not disproportionately affect the availability of housing resources to  
50 minorities, low-income populations, or children under the Proposed Action.  
51

52 The noise increase associated with contract ADAIR training is actually a decrease from pre-hurricane  
53 conditions and would not impact POIs or residential communities; therefore, there would be no

1 disproportionate impacts from minor increase in noise on minority populations, low-income communities,  
2 or children under the Proposed Action.

#### 3 4 1.4.1.5 Soil Resources

5  
6 Protection of soils was considered when evaluating potential impacts of the Proposed Action in terms of  
7 alteration of soil composition, structure, or function and any accumulation of chaff material. Effects on soils  
8 would be adverse if they alter the soil composition, structure, or function within the environment or  
9 accumulate in the soil. Under the Proposed Action, there would be no ground-disturbing activities to affect  
10 soil resources. Under the airspace, the use of defensive countermeasures (i.e., chaff and flares) has been  
11 found to be nontoxic and would not adversely affect soil resources; therefore, soil resources are not carried  
12 forward for detailed analysis.

#### 13 14 1.4.1.6 Visual Resources

15  
16 There would be no potential impacts on visual resources from the proposed contract ADAIR activities  
17 because no new construction would occur, and aircraft would utilize the existing airfield; therefore, contract  
18 ADAIR activities in the areas adjacent to the proposed facilities and aircraft parking ramp would not change  
19 the existing visual setting. Likewise, the Proposed Action would not affect the aesthetic qualities of the lands  
20 and Gulf of Mexico beneath the MOAs and Warning Areas; therefore, this resource is not carried forward  
21 for further detailed analysis in this EA.

#### 22 23 1.4.1.7 Water Resources

24  
25 Under the Proposed Action, there would be no ground-disturbing activities, including no dredging or filling  
26 of wetlands. The proposed additional contract ADAIR aircraft and personnel and associated operational  
27 and maintenance activities would not affect water quality or quantity, or wetlands. Under the airspace, the  
28 use of defensive countermeasures has been found to be nontoxic. Due to the rare and infrequent nature of  
29 fuel dumps as well as in-place safety precautions, these emergency procedures are not likely to adversely  
30 affect water resources, including wetlands; therefore, water resources are not carried forward for detailed  
31 analysis.

### 32 33 1.5 DECISION TO BE MADE

34  
35 This EA evaluates the potential environmental consequences of implementing the proposed or alternative  
36 actions to provide dedicated contract ADAIR sorties temporarily from Tyndall AFB to improve the readiness  
37 and proficiency of pilots of the 33 FW and 325 FW, other supported units, and the CAF at large. Based on  
38 the analysis in this EA, the Air Force will make one of three decisions regarding the Proposed Action: 1)  
39 choose the alternative action that best meets the purpose of and need for this project and sign a Finding of  
40 No Significant Impact (FONSI), allowing implementation of the selected alternative; 2) initiate preparation  
41 of an EIS if it is determined that significant impacts would occur through implementation of the proposed or  
42 alternative actions; or 3) select the No Action Alternative, whereby the Proposed Action would not be  
43 implemented. As required by NEPA and its implementing regulations, preparation of an environmental  
44 document must precede final decisions regarding the proposed project and be available to inform decision-  
45 makers of the potential environmental impacts.

### 46 47 1.6 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND CONSULTATIONS

#### 48 49 1.6.1 *Interagency and Intergovernmental Coordination and Consultation*

50  
51 The environmental analysis process, in compliance with NEPA guidance, includes public and agency  
52 review of information pertinent to the proposed and alternative actions. Scoping is an early and open  
53 process for developing the breadth of issues to be addressed in an EA and for identifying significant  
54 concerns related to an action. Per the requirements of Executive Order (EO) 12372, *Intergovernmental  
55 Review of Federal Programs*, as amended by EO 12416, federal, state, and local agencies with jurisdiction

1 that could potentially be affected by the proposed and alternative actions were notified during the  
2 development of this EA. Those Interagency and Intergovernmental Coordination for Environmental  
3 Planning letters and responses are included in **Appendix A**.

### 4 5 **1.6.2 Agency Consultations**

6  
7 Implementation of the Proposed Action involves coordination with several organizations and agencies.  
8 Compliance with Section 7 of the Endangered Species Act (ESA), and implementing regulations (50 CFR  
9 Part 402), requires communication with the US Fish and Wildlife Service (USFWS) and/or the National  
10 Marine Fisheries Service (NMFS) in cases where a federal action could affect listed threatened or  
11 endangered species, species proposed for listing, or candidates for listing. The Eglin Natural Resources  
12 Office would determine whether any of these species occur in the Proposed Action area. If any of these  
13 species are present, the Eglin Natural Resources Office would determine if the Proposed Action would have  
14 a potential negative effect on the species and if Section 7 consultation is required. Should no species  
15 protected by the ESA be affected by the proposed or alternative actions, no additional consultation is  
16 required. In addition, the Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1371 et seq.) makes it illegal  
17 for a person to take a marine mammal, which includes significantly disturbing the habitat, unless it is done  
18 in accordance with regulations or a permit. The Magnuson-Stevens Fishery Conservation and Management  
19 Act (16 U.S.C. § 1801) requires federal agencies to consult with the NMFS when activities may have  
20 adverse impacts on designated Essential Fish Habitat.

21  
22 Within Florida, the Office of Intergovernmental Programs, under the State Clearinghouse (SCH), is the  
23 State's single point-of-contact for the review of federal projects and federally funded activities (Florida  
24 Department of Environmental Protection [FDEP], 2017). The SCH determines if the applicant is subject to  
25 review under EO 12372; Florida Statutes, § 403.061(42); or other federal or state laws. Applications must  
26 be submitted to the SCH for any activities that may affect Florida's environment or water quality or pertains  
27 to one or more of the following state and federal laws:

- 28
- 29 • Section 216.212, Florida Statutes
- 30 • Florida Coastal Management Program
- 31 • Coastal Zone Management Act (CZMA)
- 32 • National Historic Preservation Act (NHPA)
- 33 • NEPA
- 34 • Outer Continental Shelf Lands Act
- 35

36 The application is logged and assigned a State Application Identifier, which is sent to the applicant. The  
37 SCH distributes the application to the appropriate state agencies, water management districts, regional  
38 planning councils, local governments and the Governor's Office of Planning and Budgeting for review. Once  
39 review is complete, the SCH compiles the reviewing agencies' comments and issues a clearance letter or  
40 a state process recommendation letter. All agency correspondence is included in **Appendix A**.

### 41 42 **1.6.3 Government-to-Government Consultation**

43  
44 The NHPA and its regulations at 36 CFR Part 800 direct federal agencies to consult with Indian tribes when  
45 a proposed or alternative action may have an effect on tribal lands or on properties of religious and cultural  
46 significance to a tribe. Consistent with the NHPA, Department of Defense (DOD) Instruction 4710.02,  
47 *Interactions with Federally-Recognized Tribes*, and Air Force Instruction (AFI) 90-2002, *Air Force*  
48 *Interaction with Federally-Recognized Tribes*, federally recognized tribes that are historically affiliated with  
49 lands in the vicinity of the Proposed Action have been invited to consult on all proposed undertakings that  
50 have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal  
51 consultation process is distinct from NEPA consultation or the interagency coordination process, and it  
52 requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from  
53 those of other consultations. The Tyndall AFB point of contact for Native American tribes is the Base  
54 Commander. The point-of-contact for consultation with the Tribal Historic Preservation Officer and the

1 Advisory Council on Historic Preservation is the Tyndall AFB Cultural Resources Manager. Government-  
2 to-government consultation is included in **Appendix A**.

### 4 1.7 APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS

5  
6 Implementation of the Proposed Action would involve coordination with several organizations and agencies.  
7 Adherence to the requirements of specific laws, regulations, best management practices, and necessary  
8 permits are described in detail in each resource section in **Chapter 3**.

#### 10 1.7.1 *National Environmental Policy Act*

11  
12 NEPA requires that federal agencies consider potential environmental consequences of proposed actions.  
13 The law's intent is to protect, restore, or enhance the environment through well-informed federal decisions.  
14 The CEQ was established under NEPA for the purpose of implementing and overseeing federal policies as  
15 they relate to this process. In 1978, the CEQ issued *Regulations for Implementing the Procedural Provisions*  
16 *of the National Environmental Policy Act* (40 CFR Parts 1500 through 1508). These regulations specify that  
17 an EA be prepared to

- 18 • briefly provide sufficient analysis and evidence for determining whether to prepare an EIS or a  
19 FONSI;
- 20 • aid in an agency's compliance with NEPA when no EIS is necessary; and
- 21 • facilitate preparation of an EIS when one is necessary.

22  
23 Further, to comply with other relevant environmental requirements (e.g., the ESA and NHPA) in addition to  
24 NEPA and to assess potential environmental impacts, the EIAP and decision-making process for the  
25 proposed and alternative actions involves a thorough examination of environmental issues potentially  
26 affected by government actions subject to NEPA.

#### 28 1.7.2 *The Environmental Impact Analysis Process*

29  
30 The EIAP is the process by which the Air Force facilitates compliance with environmental regulations  
31 (32 CFR Part 989), including NEPA, which is primary legislation affecting the agency's decision-making  
32 process.

### 34 1.8 PUBLIC AND AGENCY REVIEW OF ENVIRONMENTAL ASSESSMENT

35  
36 A Notice of Availability of the Draft EA and FONSI was published in the *Panama City News Herald* announcing  
37 the availability of the EA for public review and comment on **DATE TBD**. The Notice of Availability was also  
38 digitally released via **TBD**. The public and agency review period ended on **DATE TBD**. The public and agency  
39 comments are provided in **Appendix A**.

40  
41 Copies of the Draft EA and FONSI were also made available for review at the following locations:

- 42 • Bay County Public Library, 898 West 11th Street, Panama City, Florida 32401

43  
44 The Draft EA and proposed FONSI are available for review on the Tyndall AFB Environmental website at  
45 <https://>

46  
47 Those who were unable to access these documents online were asked to call Tyndall AFB Public Affairs at  
48 850-283-2126 or email **TBD** to arrange alternate access.

1

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**CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

**2.1 PROPOSED ACTION**

The Air Force is proposing to temporarily provide dedicated contract ADAIR sorties for CAF training in support of the 33<sup>rd</sup> and 325<sup>th</sup> Fighter Wings to address shortfalls in F-35/F-22 pilot training and production capability and provide the necessary capability and capacity to employ adversary tactics across the training spectrum from basic fighter maneuvers to higher-end, advanced combat training missions. Training scenarios would include the use of combat tactics and procedures that differ from CAF tactics to simulate an opposing force. The Proposed Action includes elements affecting the base and military training airspace. The elements affecting Tyndall AFB include contract ADAIR aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the airspace include airspace use and defensive countermeasures.

Numbers of contract ADAIR aircraft, maintenance personnel, and pilots were estimated and informed through multiple meetings with active duty and civilian Air Force functional area experts and were based on sortie requirements developed by the end user at the base. Numbers of aircraft and personnel were then used to define facility requirements, which were estimated using planning factors from Air Force Manual (AFMAN) 32-1084, *Facility Requirements*. These numbers are an estimate based on the current and proposed approximate baseline for the units, aircraft, and flying rates at Eglin AFB.

**2.1.1 Contract Adversary Air Aircraft**

Contract ADAIR would have multiple aircraft available with acceptable capabilities to support training requirements. Contract ADAIR proposed aircraft specifications are described in **Table 2-1**; all aircraft listed are capable of providing contract ADAIR support to F-35 and F-22 CAF aircrews stationed at Eglin AFB. One or a combination of these aircraft types may be operated by a contractor at Tyndall AFB in support of ADAIR training. The Proposed Action at Tyndall AFB would include the establishment of an estimated 78 contracted maintainers and 15 contracted pilots who would operate an estimated 12 aircraft.

**Table 2-1. Contract Adversary Air Potential Aircraft Specifications**

Aircraft	Wingspan (feet)	Length (feet)	Height (feet)	Number of Engines
MiG-29	38	57	16	2
F-5	27	48	14	2
Dassault Mirage	27	51	15	1
F-16	33	50	17	1
Eurofighter Typhoon	35	48	13	2
JAS-39 Gripen	27	47	16	1

**2.1.2 Facilities**

Tyndall AFB has existing facilities to support the Proposed Action. The proposed facilities are available for use and require minimal modification. They are located around the existing airfield and runway and include the necessary ramp space; maintenance space; operational space; petroleum, oil, and lubricants storage; runway access; and associated parking to support the contract ADAIR mission. In addition, the Munitions Storage Area has sufficient facilities to store the necessary increase in training countermeasure allocations (chaff/flares; discussed further in **Section 2.1.7**). A summary of estimated facilities requirements needed to satisfy the Proposed Action is provided in **Table 2-2**.

**Table 2-2. Tyndall Air Force Base Facilities Requirements**

<b>Ramp Required (yd<sup>2</sup>)</b>	<b>Number Maintenance Personnel*</b>	<b>Number Pilots*</b>	<b>Aircraft Maintenance Unit Space (ft<sup>2</sup>)</b>	<b>Stand-Alone Operations Space (ft<sup>2</sup>)</b>	<b>Integrated Operations Space (ft<sup>2</sup>)</b>
8,400	78	15	3,100	2,000	1,200

Notes:

\* The number of personnel is estimated, and the final number may be slightly higher or lower depending on operational needs.

Ft<sup>2</sup> = square feet; yd<sup>2</sup> = square yards

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Contract ADAIR operations at Tyndall AFB would initially occur from Building 503. Contract ADAIR pilots would participate in pre-flight crew briefs and post-flight debriefs with Air Force pilots of the 33 FW, the 325 FW and other units as required. Briefs and debriefs would occur telephonically or via video teleconference. Following training sorties, contract ADAIR pilots would land and park their aircraft at Tyndall AFB on the fighter ramp area. As Tyndall AFB rebuilds, operations may be relocated to another suitable facility along the flightline to ensure ADAIR operations and Tyndall reconstruction can occur simultaneously. Contract ADAIR maintenance operations would be located in a temporary clamshell-like structure that would be erected on existing pavement on the flightline. No new construction would be completed during the temporary period to support ADAIR.

THE AIRCRAFT MAINTENANCE UNIT (AMU) IS THE SUPPORT FUNCTION RESPONSIBLE FOR THE DIRECT SUPPORT AND MAINTENANCE OF AIRCRAFT TO ENSURE THEY ARE MISSION CAPABLE. AMU SPACE INCLUDES DEDICATED FACILITIES FOR CONTRACT MAINTENANCE PERSONNEL AND OFFICE AND ADMINISTRATIVE SPACE, PLUS SPECIAL USE SPACE FOR A TOOL CRIB, PARTS STORAGE, AND SECURE STORAGE. THE CONTRACT ADVERSARY AIR (ADAIR) AMU IS INTENDED, FOR ACCOUNTABILITY PURPOSES, TO REMAIN PHYSICALLY SEPARATED FROM ANY AIR FORCE MAINTENANCE ORGANIZATION. CONVERSELY, CONTRACT ADAIR OPERATIONS SPACE MAY, AT THE DISCRETION OF THE HOST UNIT, BE A SEPARATE STAND-ALONE FACILITY OR BE INTEGRATED INTO AN EXISTING AIR FORCE OPERATIONS FACILITY. STAND-ALONE OPERATIONS SPACE INCLUDES OFFICE AND ADMINISTRATIVE SPACE, PLUS SPECIAL USE SPACE FOR AIRCREW FLIGHT EQUIPMENT, MISSION PLANNING, AND SECURE STORAGE. INTEGRATED OPERATIONS SPACE INCLUDES REDUCED AMOUNTS OF OFFICE, ADMINISTRATIVE, AND SPECIAL USE SPACE BECAUSE OF ANTICIPATED ECONOMIES OF SCALE REALIZED WHEN FACILITIES ARE SHARED WITH ANOTHER ORGANIZATION.

Contract ADAIR aircraft would use Defense Logistics Agency's Jet A aircraft fuel that would be delivered in fuel trucks owned and operated by the 325th Logistics Readiness Squadron (325 LRS). Contract ADAIR personnel would be responsible for all aircraft fuel and defuel operations. No additional personnel in the 325 LRS would be needed to support the additional deliveries.

Contract ADAIR aircraft would use chaff and flares (also refer to **Section 2.1.7** for additional information on defensive countermeasures). The contract ADAIR aircraft may employ chaff and flares that are in the Air Force inventory or chaff and flares that are contractor-provided external to the Air Force inventory. For the purpose of this EA, all aircraft are modeled with Air Force provided RR-188 chaff and M206 flares. The ADAIR contractor would receive an allocation for chaff and flares through the 325th Maintenance Squadron (325 MXS), Munitions Flight. 325 MXS munitions personnel would store, account for, inspect, maintain, assemble, and deliver chaff and flares to contract ADAIR aircraft; contract personnel would be responsible for loading, unloading, and accountability of chaff and flares provided to their aircraft.

If contract ADAIR aircraft utilize chaff and flares not in the government's inventory, then additional NEPA compliance review would be required. All work to account for, inspect, maintain, assemble, deliver, load, and unload chaff/flare to contract ADAIR aircraft would be the responsibility of the contractor. Government storage of contractor-provided chaff and flare may be considered after appropriate authority is granted.



Figure 2-1 Proposed Location for ADAIR Operations, Aircraft Maintenance Unit and Hangar Space

The additional munitions functions would not require additional munitions personnel. Contractor maintenance personnel would be responsible for the inspection and maintenance of all external stores (e.g., captive air training missiles, electronic countermeasure pods). The ejector cartridges required for external stores would be considered contractor-furnished equipment. Some minor support from 325 MXS for egress system munitions (i.e., cartridge-actuated devices [CADs] and propellant-actuated devices [PADs]) may be necessary; however, the level of support is expected to be extremely minor and very infrequent. All required Aerospace Ground Equipment (AGE) would be owned and maintained by the contractor. Fuel for AGE would be obtained by contract ADAIR personnel from the base Defense Logistics Agency fuel station through an account established with 325 LRS.

AEROSPACE GROUND EQUIPMENT IS SUPPORT EQUIPMENT REQUIRED FOR AIRCRAFT MAINTENANCE AND SORTIE GENERATION AND IS COMPOSED OF EQUIPMENT SUCH AS GENERATORS, AIR COMPRESSORS, PORTABLE LIGHT SOURCES, TOW BARS, AND MOBILE LIQUID OXYGEN AND NITROGEN SOURCES.

### 2.1.3 Maintenance

Maintenance would use hangar space and AMU facilities in a temporary clamshell-like structure to perform limited maintenance operations on contract ADAIR aircraft. Contract ADAIR aircraft maintenance would include routine inspections and minor unscheduled repairs on the flightline. Aircraft requiring major scheduled (depot level maintenance) or unscheduled maintenance would be expected to be flown back to the contractor's home base for repairs. For the rare occasions when an aircraft is not flyable, the contractor would dispatch a temporary field repair team to Tyndall AFB to repair the aircraft. Any additional maintenance support requirements (e.g., aircraft fuel cell, defueling, aircraft structural assets,

1 nondestructive inspection Joint Oil Analysis Program tests) would be coordinated with 325th Maintenance  
2 Group and 325 LRS, as appropriate on a noninterference basis.

#### 3 4 2.1.4 Personnel

5  
6 Tyndall AFB would be staffed by an estimated 78 additional contracted maintenance personnel who would  
7 primarily operate out of the temporary structure. Implementation of the Proposed Action would also employ  
8 an estimated 15 contracted pilots that would primarily operate out of Building 503. It is expected that the  
9 initial personnel would arrive about 90 days after a contractor is selected and the estimated arrival on  
10 Tyndall AFB is between 2020 and 2021.

#### 11 12 2.1.5 Sorties

13  
14 The Proposed Action would contract for an estimated 12 contractor aircraft to fly an estimated 2,400 annual  
15 sorties in support of the 33 FW, the 325 FW and other units at Eglin AFB. The number of sorties expected  
16 to support other units would be small and would not significantly increase the number of expected sorties.  
17 This number of sorties includes sorties expected for contractor training activities (refer to **Section 2.1.6**)  
18 and aircraft leaving for or returning from either maintenance or other deployments.

19  
20 Air Force convention is to describe daily flying schedules in terms of total sorties and a “flight turn pattern.”  
21 A flight turn pattern allows the Air Force to fly available aircraft multiple times per day to maximize available  
22 flying opportunities for assigned pilots. Flight turn patterns are  
23 designed to allow aircraft to fly, land, complete appropriate post  
24 flight inspections, refuel, and fly again. The maximum flight turn  
25 pattern that would be flown by contract ADAIR support would be an  
26 8 x 6.

27  
28 Contract ADAIR pilots may fly very few additional traffic patterns at  
29 Tyndall AFB to maintain their currency and proficiency as required.  
30 Additional traffic patterns would be anticipated on no more than  
31 14 percent of the annual daytime sortie total, about 324 sorties of  
32 the total training sorties.

33  
34 The baseline used for comparison is the pre-hurricane operations  
35 level. The “current” or “during base reconstruction” state would not  
36 be a useful baseline since it reflects no active assigned flying mission for the 325 FW. After implementation  
37 of the Proposed Action, total airfield operations at Tyndall AFB would be an estimated 50 percent less than  
38 baseline conditions due to the F-22 FTU and associated T-38 aircraft being temporarily based at Eglin AFB  
39 and the inactivation of the 95<sup>th</sup> Fighter Squadron. Airfield operations would decrease even more after the  
40 F-22 FTU and associated T-38s are relocated to their permanent location. Refer to **Section 2.1.6** for more  
41 information on training operations. Contract ADAIR aircraft would not normally fly during environmental  
42 night hours (10:00 p.m. to 7:00 a.m. local time; refer to Air Force Handbook 32-7084, *AICUZ Program*  
43 *Manager’s Guide*) but may support local requirements as approved by Tyndall AFB authorities.

#### 44 45 2.1.6 Airspace Use

46 The locations of the airspace that would be used for contract ADAIR  
47 are depicted on **Figure 1-4** and **Figure 1-5 (Section 1.1.2)**. Current  
48 and projected annual training activities in the airspace are  
49 summarized in **Table 2-3**. The baseline airspace training sorties  
50 utilizes operations data for Eglin AFB, including the F-22 FTU and T-  
51 38 aircraft from Tyndall AFB and excluding the Navy F-35C aircraft as  
52 analyzed in the Special EA (Air Force, 2019). Proposed contract  
53 ADAIR sorties would generally consist of the following five steps:  
54 depart from Tyndall AFB runway, transit from Tyndall AFB airfield to  
55 airspace, perform ADAIR training, transit back to Tyndall AFB, and

A TURN PATTERN OF 8 X 6 DOES NOT REQUIRE 14 AIRCRAFT TO EXECUTE BUT RATHER COULD BE FILLED WITH ONLY 8 AIRCRAFT (NOTWITHSTANDING IMPACTS OF BROKEN AIRCRAFT AND AIRSPACE SCHEDULES). THE TURN PATTERN AND TOTAL DAILY SORTIES ARE THE SAME FOR ENVIRONMENTAL PURPOSES, BECAUSE THEY BOTH INDICATE THE NUMBER OF TAKEOFFS AND LANDINGS FOR ANY GIVEN DAY. AN 8 X 6 REPRESENTS 14 TOTAL SORTIES FOR THE DAY EVEN THOUGH THOSE SORTIES MAY HAVE BEEN FLOWN WITH ONLY EIGHT TOTAL AIRCRAFT.

MEAN SEA LEVEL (MSL) IS ALTITUDE IN FEET ABOVE THE MEAN SEA LEVEL. AND ABOVE GROUND LEVEL (AGL) IS ALTITUDE EXPRESSED IN FEET MEASURED ABOVE THE SURFACE OF THE GROUND. WHEN FLYING OVER LAND, BOTH MSL AND AGL ARE USED TO DELINEATE AIRSPACE STRUCTURE. FLIGHT LEVEL (FL) IS VERTICAL ALTITUDE EXPRESSED IN HUNDREDS OF FEET.

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land at Tyndall AFB. Contract ADAIR aircraft would spend 5 to 20 minutes in transit each way between the airfield and airspace. Time spent within the airspace (W-151, W-470, Rose Hill MOA/ATCAA, Eglin E MOA/ATCAA, Tyndall B, C/H and E MOA/ATCAA) would depend upon the specific training mission performed but would typically last 45 to 60 minutes. Supersonic operations are currently allowed in the MOAs at altitudes greater than 30,000 ft above mean sea level (MSL). Contractor operations would occur in these special use airspaces concurrent to the 33 FW, the 325 FW or other supported Air Force units. No airspace modifications would be required for contract ADAIR as part of the Proposed Action.

**Table 2-3. Current and Projected Annual Training Activities in Support of Eglin Air Force Base**

Airspace	Current Altitude <sup>1</sup>	Baseline Training Sorties <sup>2</sup>	Projected Contract ADAIR Training Sorties <sup>3</sup>	Projected Total Sorties
W-151	Surface to Unlimited	12,191	947	13,479
W-470	Surface to Unlimited (or as assigned); floor restricted to 5,000 ft MSL in ACMI East and West		341	
Rose Hill MOA/ ATCAA	8,000 ft MSL to FL230	744	183	927
Eglin E MOA / ATCAA	Surface to Unlimited	3,416	825	4,241
R-2419A / R-2519A	Surface to Unlimited	180	0	180
Tyndall E MOA (Carrabelle ATCAA)	300 ft AGL to 17,999 ft MSL (FL180 to FL230 or as assigned)	9,307	12	9,319
Tyndall B and H MOAs (Compass Lake ATCAA)	9,000 ft MSL to 17,999 ft MSL (FL180 to FL230 or as assigned)	2,628	3	2,631
Tyndall C MOA (Compass Lake ATCAA)	300 ft AGL to 6,000 ft MSL (FL180 to FL230 or as assigned)	6,711	9	6,720
<b>Total Proposed Airspace Sorties</b>		<b>35,177</b>	<b>2,320</b>	<b>37,497</b>

Source: 96 CEG/CEIEA (96th Civil Engineer Group/Environmental Assets), personal communication, 19 April 2018

Notes:

<sup>1</sup> No change to current minimum flight altitude is proposed.

<sup>2</sup> Based on 33rd Fighter Wing, 325 FW, 85th Test Squadron, 53rd Wing, 96th Test Wing. The baseline includes the F-22 and T-38 aircraft from Tyndall AFB analyzed in the Special Environmental Assessment and excludes the Navy F-35C aircraft expected to depart Eglin Air Force Base in July 2019.

<sup>3</sup> A total of 80 of the 2,400 contractor sorties would not be traveling from Tyndall AFB to the airspace; they would return to contractor's base for maintenance or pilot proficiency training.

ADAIR = adversary air; AFB = Air Force Base; ATCAA= Air Traffic Control Assigned Airspace; FL = flight level (vertical altitude expressed in hundreds of feet); ft = feet; MOA = Military Operations Area; MSL = mean sea level; W = Warning Area

**2.1.7 Defensive Countermeasures**

While contract ADAIR aircraft would not carry or employ live or inert munitions, aircraft would operate with advanced radar and electronic targeting systems during engagements. Contract ADAIR aircraft would employ chaff and flares (RR-188 chaff and M206 flares or similar) during 100 percent of their training sortie operations. Chaff and flares are the principal defensive countermeasures dispensed by military aircraft to avoid detection or attack by enemy air defense systems.

Chaff is an electronic countermeasure designed to reflect radar waves and obscure aircraft, ships, and other equipment from radar tracking sources. Chaff bundles consist of millions of fibers of nonhazardous aluminum-coated glass fibers. When ejected from the aircraft, these fibers disperse widely in the air, forming an electromagnetic screen that temporarily hides the aircraft from radar and forms a radar decoy, allowing the aircraft to defensively maneuver or leave the area. Flares are magnesium pellets ejected from military aircraft and provide high-temperature heat sources that act as decoys for heat-seeking weapons targeting the aircraft. These defensive countermeasures are utilized to keep aircraft from being successfully targeted by or escape from weapons such as surface-to-air missiles, air-to-air missiles, anti-aircraft artillery, and in the case of the Proposed Action, other aircraft.

The existing and estimated additional chaff and flare use are presented in **Table 2-4**. Frequent training in use of chaff and flares by aircrews to master the timing of deployment and the capabilities of the devices is a critical component of ADAIR training. Chaff and flares (types similar to RR-188 chaff and M206 flares) are proposed for annual use in contract ADAIR training. While 100 percent of the requirement may not be allocated or expended, this amount is carried forward to determine potential impact associated with defensive countermeasures.

**Table 2-4. Existing and Proposed Defensive Countermeasure Use**

Special Use Airspace	Countermeasure Type	Current Baseline Use <sup>1</sup>	Total Estimated Future Use <sup>2</sup>
Warning Area W-151 <sup>3</sup>	Chaff Bundles	9,110	10,553
	Flares	16,783	21,516
Warning Area W-470 <sup>3</sup>	Chaff Bundles	11,291	12,239
	Flares	26,282	27,987
Rose Hill MOA	Chaff Bundles <sup>4</sup>	0	0
	Flares <sup>5</sup>	1,644	2,257
Eglin E MOA	Chaff Bundles	5,077	6,451
	Flares	7,387	10,182
R-2419A / R-2519A	Chaff Bundles	1,800	1,800
	Flares	720	720
Tyndall E MOA (Carrabelle ATCAA) <sup>6</sup>	Chaff Bundles	403	436
	Flares	939	999
Tyndall B and H MOAs (Compass Lake ATCAA) <sup>6</sup>	Chaff Bundles	403	411
	Flares	939	953
Tyndall C MOA (Compass Lake ATCAA) <sup>7</sup>	--	--	--

Notes:

- <sup>1</sup> Current baseline use includes Fiscal Year 2018 33rd Fighter Wing use added to F-22 FTU baseline numbers while it was operating at Tyndall Air Force Base. Of the airspace identified for contract ADAIR use, the F-22 expendables only apply to W-151 and W-470 since the F-22 FTU does not use the Rose Hill and Eglin E MOAs.
- <sup>2</sup> This reflects contract ADAIR estimated defensive countermeasure use added to the baseline use. With the addition of contract ADAIR, there would be an estimated 25 percent savings in the amount of chaff and flares used by the CAF due to no longer being tasked to fly CAF self-generated Red Air support. These quantities do not include the F-22 FTU aircraft expenditures since it is expected the FTU would be repositioned prior to the arrival of contract ADAIR aircraft.
- <sup>3</sup> Countermeasures are authorized for use above 1,000 ft above sea level
- <sup>4</sup> Chaff is not authorized for use in the Rose Hill MOA
- <sup>5</sup> Flares are authorized for use above 8,500 feet above mean sea level.
- <sup>6</sup> Countermeasure use is only authorized above 9,000 ft MSL within lateral confines of the MOA.
- <sup>7</sup> Due to altitude restrictions, the use of countermeasures is not authorized below 9,000 ft MSL and would not be used in the Tyndall C MOA.

ADAIR = adversary air; CAF = Combat Air Forces; FTU = formal training unit; MOA = Military Operations Area

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2

1 2.2 SELECTION STANDARDS  
2

3 As discussed in Chapter 1, the need for the proposed action is to temporarily implement contract ADAIR at  
4 Tyndall AFB because Eglin AFB does not currently have facilities or capacity to accommodate ADAIR  
5 operations. In order to assess viable alternatives for the contract ADAIR implementation at Tyndall AFB,  
6 the following selection standards were applied:

- 7 1. Mission: In addition to supporting Air Force-prioritized missions as described in **Section 1.1.1**,  
8 contract ADAIR alternatives must not displace, interfere with, detract from, or reduce other Air  
9 Force missions or combat operations worldwide.
- 10 2. Airspace Capacity: Alternatives must have the airspace capacity to support force-on-force training  
11 engagements and must be able to safely support the contract ADAIR sorties in the airspace.  
12 Airspace must be large enough to effectively support realistic air-to-air training. Viable  
13 alternatives should not require establishing new military airspace but should occur within existing  
14 surrounding military airspace.
- 15 3. Facilities: Alternatives must leverage existing facilities that support the contract ADAIR  
16 requirements with minimal short duration, low-cost renovations, if any are needed. Alternatives  
17 must have existing
- 18 a. operations work/office space;
  - 19 b. aircraft parking and hangar space;
  - 20 c. maintenance work/office space;
  - 21 d. munitions storage space;
  - 22 e. fuel storage capacity and delivery capability; and
  - 23 f. a runway of sufficient length for takeoff and landing of applicable aircraft, with appropriate  
24 safety features, infrastructure, and clear zones (CZs) to ensure safe operations.
- 25 4. Cost and Time: Contract ADAIR locations would need to support costs of facilities renovations from  
26 within their existing Operations and Maintenance budgets. Viable alternatives must not require  
27 major renovations or funding to implement. Furthermore, as CAF pilot readiness is currently an  
28 urgent need, viable ADAIR alternatives must be able to support ADAIR activities in the near term.  
29 Solutions that cannot be implemented within the next six months, therefore, do not meet the  
30 purpose and need for the initiative.  
31

32 2.3 SCREENING OF ALTERNATIVES  
33

34 The following potential alternatives were considered:

- 35 • Alternative 1 – Establish contract ADAIR capabilities (an estimated 12 aircraft) providing  
36 2,400 annual sorties at Tyndall AFB for support in W-151, W-470, the Rose Hill, Eglin E, Tyndall  
37 E, Tyndall B and H, Tynall C MOAs, and R-2419A/F-2519A. ADAIR operations would be located  
38 in Building 503 and maintenance functions and hanger space would occur in a temporary  
39 clamshell-like structure on the flightline.
- 40 • Alternative 2 – Establish an additional Air Force AGRS of military pilots to fly CAF ADAIR aircraft  
41 (an estimated 12 aircraft) providing 2,400 annual sorties at Tyndall AFB for support in W-151, W-  
42 470, the Rose Hill, Eglin E, Tyndall E, Tyndall B and H, Tynall C MOAs, and R-2419A/F-2519A.
- 43 • Alternative 3 – Establish contract ADAIR capabilities (an estimated 12 aircraft) providing  
44 2,400 annual sorties at Tyndall AFB for support in W-151, W-470, the Rose Hill, Eglin E, Tyndall  
45 E, Tyndall B and H, Tynall C MOAs, and R-2419A/F-2519A. New hangars and operations and  
46 maintenance facilities would be constructed.
- 47 • Alternative 4 – Establish dedicated CAF ADAIR by tasking organic CAF units to provide the  
48 capability.  
49

50 The selection standards described in **Section 2.2** were applied to these alternatives to determine which  
51 could support contract ADAIR requirements and fulfill the purpose and need for the Proposed Action. The  
52 four alternatives considered above are compared in **Table 2-5, Comparison of Alternatives**.  
53  
54  
55

**Table 2-5. Comparison of Alternatives**

Alternative Actions	Selection Standard				Meets Purpose and Need
	1. Mission	2. Airspace	3. Facilities	4. Cost and Time	
<b>Alternative 1</b>	Yes	Yes	Yes	Yes	<b>YES</b>
<b>Alternative 2</b>	No	Yes	Yes	No	<b>NO</b>
<b>Alternative 3</b>	Yes	Yes	No	No	<b>NO</b>
<b>Alternative 4</b>	No	Yes	Yes	Yes	<b>NO</b>

1  
2  
3 **2.4 ALTERNATIVE ACTIONS ELIMINATED FROM FURTHER CONSIDERATION**  
4

5 Three alternatives were considered and eliminated from further consideration because they would not meet  
6 the purpose and need for the action or the selection standards (refer to **Section 2.3**). These alternatives  
7 included the following:

- 8 • Alternative 2: Establish an additional Air Force AGRS of military pilots to fly CAF ADAIR aircraft (an  
9 estimated 12 aircraft) providing 2,400 annual sorties at Tyndall AFB. Establishing a new Air Force  
10 AGRS of 4th generation aircraft would meet many of the selection standards; however, it would  
11 take a large amount of time to implement. It takes more than a decade to train an Air Force pilot.  
12 Establishing another organic AGRS would require intensive planning, budgeting, and training of  
13 Air Force pilots before they would be ready to execute their mission. Rapid stand-up and manning  
14 of additional AGRS squadrons would be possible but not without reducing both manpower and  
15 combat platforms available to support combat operations. Due to the timeframe and/or reductions  
16 in combat mission capacity involved, this alternative fails to meet Selection Standards 1 and 4  
17 and does not meet the purpose and need for the Proposed Action.
- 18 • Alternative 3: Establish contract ADAIR capabilities (an estimated 12 aircraft) providing 2,400  
19 annual sorties at Tyndall AFB and constructing new hangars and operations and maintenance  
20 facilities. Establishing the contract ADAIR mission with new facilities construction was considered  
21 but not carried forward, as the alternative requires the construction of new facilities and does not  
22 provide support in the timely manner needed to address the pilot readiness crisis, and as such  
23 does not meet Selection Standards 3 and 4. It would take 4 to 5 years to plan, program, budget,  
24 appropriate, design, and construct new facilities. This would not support the purpose and need  
25 for the Proposed Action.
- 26 • Alternative 4: Establish dedicated CAF ADAIR by tasking organic CAF units to provide the  
27 capability. Tasking organic 4th generation assets to provide dedicated ADAIR support to Eglin  
28 AFB would result in both a reduction of combat power applied worldwide as well as continued  
29 degradation of the unit's own readiness. The units employing 4th generation aircraft, such as the  
30 F-16, are heavily engaged in deployments and overseas missions. Under this alternative, these  
31 units would continue to struggle with providing for their own proficiency, while maintaining support  
32 for both combat operations and CAF ADAIR. Such an alternative does not meet Selection  
33 Standard 1 or the overarching purpose and need for the Proposed Action.  
34

35 **2.5 DETAILED DESCRIPTION OF THE SELECTED ALTERNATIVES**  
36

37 NEPA and the CEQ regulations mandate the consideration of reasonable alternatives to the Proposed  
38 Action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for  
39 the Proposed Action. The NEPA process is intended to support flexible, informed decision-making; the  
40 analysis provided by this EA and feedback from the public and other agencies will inform decisions made  
41 about whether, when, and how to execute the Proposed Action. One alternative action meets the purpose  
42 of and need for the action, satisfies the criteria set forth in the selection standards, and was carried forward  
43 for further detailed analysis in this EA. The No Action Alternative provides a benchmark used to compare

1 potential impacts of the Proposed Action. Alternatives carried forward for evaluation are described below  
2 in **Sections 2.5.1** and **2.5.2**.

3  
4 **2.5.1** *Proposed Action: Contract Adversary Air Operating Out of Building 503 and*  
5 *Temporary Structure*

6  
7 Under the Proposed Action, the Air Force would establish contract ADAIR capabilities (an estimated  
8 12 aircraft) providing 2,400 sorties at Tyndall AFB annually. Operations would be located in Building 503  
9 and the AMU would be in a temporary clamshell-like structure on the flightline, which would also have  
10 hangar space available for aircraft maintenance. The contract ADAIR Operations would participate in crew  
11 briefs and debriefs via video teleconference. The contract ADAIR aircraft, maintenance, personnel, sorties,  
12 airspace use, and defensive countermeasures would be as described under Proposed Action.

13  
14 **2.5.2** *No Action Alternative*

15  
16 Analysis of the No Action Alternative provides a benchmark, enabling decision-makers to compare the  
17 magnitude of the potential environmental effects of the Proposed Action. NEPA requires an EA to analyze  
18 the No Action Alternative. No action means that an action would not take place at this time, and the resulting  
19 environmental effects from taking no action would be compared with the effects of allowing the proposed  
20 activity to go forward. No action for this EA reflects no contract ADAIR assets would be established in  
21 support of Eglin AFB at Tyndall AFB. Organic Eglin AFB support would result in further reduction in pilot  
22 proficiency and combat readiness. Eglin AFB self-generated ADAIR support, the status quo following  
23 calendar year 2017 fighter pilot production increase goals, has produced a decline in fighter pilot training  
24 quality resulting in unsustainable operations which pose an unacceptable risk to national security. Aircraft  
25 tasked to support CAF ADAIR missions organically from within the Air Force would continue to experience  
26 their own readiness and proficiency challenges.

27  
28 Tyndall AFB airfield operations have varied over the years due to aircraft realignments, pre/post-hurricane  
29 aircraft relocations, and other factors discussed in this chapter, which have affected this airfield's annual  
30 usage. A 2016 Air Installations Compatible Use Zones (AICUZ) Study noted that Tyndall AFB airfield  
31 operations over a 6-year period generally ranged from about 22,000 to 61,000; this study projected 66,000  
32 operations by 2018 (USAF, 2016a) which was the approximate actual rate prior to the hurricane. During  
33 the post hurricane period there are still ongoing airfield operations at Tyndall AFB, but these operations are  
34 significantly reduced from the pre hurricane level.

35  
36  
37 **2.6 SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES**

38  
39 The potential impacts associated with the Proposed Action and the No Action Alternative are summarized  
40 in **Table 2-6**. The summary is based on information discussed in detail in **Chapter 4 (Environmental**  
41 **Consequences)** of the EA and includes a concise definition of the issues addressed and the potential  
42 environmental impacts associated with the proposal.

1

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**Table 2-6  
Comparison of Potential Environmental Consequences of the Proposed Action**

Alternative	Resource						
	Airspace Management and Use	Noise	Safety	Air Quality	Biological Resources	Cultural Resources	Hazardous Materials and Wastes, Contaminated Sites, and Toxic Substances
<p><b>Proposed Action:</b> <b>Contract ADAIR operations with 2,400 contracted sorties</b> <b>Operations and maintenance activities in Bldg 503 and temporary flightline structure.</b></p>	<p>● <b>Tyndall AFB</b> Eglin AFB Negligible impacts</p> <p>● <b>Special Use Airspace</b> Negligible impacts</p>	<p>● <b>Tyndall AFB</b> Overall noise levels would be much lower than pre-hurricane levels. Tyndall would experience some minor noise impacts associated with temporary ADAIR operations including slightly noticeable increases at 11 POIs and negligible to minor impacts at local elementary schools (refer to Section 4.2.2.1).</p> <p>● <b>Special Use Airspace</b> Impacts associated with sonic booms would be negligible</p>	<p>● <b>Tyndall AFB</b> No impacts on ground, explosive, or flight safety</p> <p>● <b>Special Use Airspace</b> No impacts on ground, explosive, or flight safety</p>	<p>● <b>Tyndall AFB</b> Criteria pollutant emissions would be lower than the baseline environment due to the departure of the F-22 ops squadron, F-22 FTU and supporting T-38 aircraft prior to the arrival of contract ADAIR.</p> <p>● No impact on the region's ability to comply with the NAAQS for regulated pollutants Will not hamper efforts to maintain compliance with ozone NAAQS</p> <p>● <b>Special Use Airspace</b> No impact from criteria pollutant emissions No impact on the region's ability to meet NAAQS for all regulated pollutants</p>	<p>● <b>Tyndall AFB</b> Overall, less impact than the baseline environment on and surrounding Tyndall AFB due to the departure of the F-22 ops squadron, F-22 FTU and supporting T-38 aircraft prior to the arrival of contract ADAIR</p> <p>● No impacts on vegetation communities or habitat. Negligible, short- and long-term impacts on wildlife, including birds Minor impacts on birds from potential aircraft/bird collisions No impacts on federally listed species</p> <p>● <b>Special Use Airspace</b> Negligible impacts on marine wildlife Minor impacts on birds and terrestrial mammals from low altitude training operations Minor impacts on the black skimmer from use of chaff and flares May affect but not likely to adversely affect federally listed red-cockaded woodpecker, piping plover, red knot, marine mammals, sea turtles, giant manta ray, Gulf sturgeon and whitetip oceanic shark No impact on Essential Fish Habitat No impacts from noise, including sonic booms</p>	<p>● <b>Tyndall AFB</b> No impact on historic properties or archaeological resources No known traditional cultural resources or sacred sites are present</p> <p>● <b>Special Use Airspace</b> No impact on potential submerged archaeological resources.</p>	<p>● <b>Tyndall AFB</b> No impacts on hazardous waste management No impacts on asbestos-containing materials and lead-based paint management Long-term, minor, beneficial impact on managing and disposal of polychlorinated biphenyls No impacts from radon No environmental contamination</p> <p>● <b>Special Use Airspace</b> N/A</p>
<p><b>No Action Alternative*</b></p>	<p>● No change to airspace management and use at Tyndall AFB or in the special use airspace</p>	<p>● Noise levels would be lower than those of the Proposed Action due to the departure of the F-22 FTU and associated T-38 aircraft</p>	<p>● No change to ground, flight, or explosive safety at Tyndall AFB or in the special use airspace</p>	<p>● No change to air quality at Tyndall AFB or in the special use airspace</p>	<p>● No change to biological resources at Tyndall AFB or in the special use airspace</p>	<p>● No change to cultural resources at Tyndall AFB or in the special use airspace</p>	<p>● No change to hazardous materials and wastes, contaminated sites, and toxic substances at Tyndall AFB</p>

1 Notes:  
2 \* Under the No Action Alternative, contract ADAIR to support Eglin AFB would not be temporarily located at Tyndall AFB.  
3 ● No, minor, or negligible impact ○ Moderate impact but not significant ● Major, significant impact  
4 ADAIR = adversary air; AFB = Air Force Base; FTU = formal training unit; N/A = not applicable; NAAQS = National Ambient Air Quality Standard

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1 **CHAPTER 3**            **AFFECTED ENVIRONMENT**  
2

3 **3.1**    **SCOPE OF THE ANALYSIS**  
4

5 Existing environmental conditions could be affected by the Proposed Action and No Action Alternative. The  
6 existing conditions for relevant resources are defined to provide a meaningful baseline from which to  
7 compare potential future effects. In this chapter, each resource is defined, the geographic scope is  
8 identified, followed by a description of the existing conditions for that resource. The expected geographic  
9 scope of potential consequences is referred to as the ROI. The ROI boundaries will vary depending on the  
10 nature of each resource. For example, the ROI for some resources, such as socioeconomics – income and  
11 employment and air quality, extend over a larger jurisdiction unique to the resource. In addition, some  
12 resources discuss the available baseline data, installation (base) and airspace, in the same section and  
13 some discuss these elements separately, depending on the complexity of the ROI and the relationship of  
14 the base to the airspace.  
15

16 **3.1.1**        *Resources Analyzed*  
17

18 Based on the components of the Proposed Action, the Air Force determined that there would be  
19 temporary effects due to the nature of this flying mission and use of the Tyndall airfield and Special Use  
20 Airspace. As a result of this review, resource categories evaluated are: airspace management and use,  
21 noise, safety and occupational health, air quality, biological resources, cultural resources, hazardous  
22 materials and wastes, toxic substances, and contaminated sites.  
23

24 **3.2**    **AIRSPACE MANAGEMENT AND USE**  
25

26 **3.2.1**        *Definition of the Resource*  
27

28 Airspace management involves the direction, control, and handling of flight operations in the airspace that  
29 overlies the borders of the United States and its territories. Under Title 49, U.S.C. § 40103, *Sovereignty*  
30 *and Use of Airspace*, and Public Law No. 103-272, the US government has exclusive sovereignty over the  
31 nation's airspace. The FAA has the responsibility to plan, manage, and control the structure and use of all  
32 airspace over the United States. FAA rules govern the national airspace system, and FAA regulations  
33 establish how and where aircraft may fly. Collectively, the FAA uses these rules and regulations to make  
34 airspace use as safe, effective, and compatible as possible for all types of aircraft, from private propeller-  
35 driven planes to large, high-speed commercial and military jets.  
36

37 Aircraft use different kinds of airspace according to the specific rules and procedures defined by the FAA  
38 for each type of airspace. For the Proposed Action, the airspace used are MOAs, ATCAAs, and Warning  
39 Areas. A MOA is designated airspace outside of Class A airspace used to separate or segregate certain  
40 nonhazardous military activities from Instrument Flight Rules (IFR) traffic and to identify for Visual Flight  
41 Rules (VFR) traffic where these activities are conducted (14 CFR § 1.1). Activities in MOAs include, but are  
42 not limited to, air combat maneuvers, air intercepts, and low-altitude tactics. The defined vertical and lateral  
43 limits vary for each MOA. While MOAs generally extend from 1,200 ft above ground level (AGL) to 18,000 ft  
44 MSL, the floor may extend below 1,200 ft AGL if there is a mission requirement and minimal adverse  
45 aeronautical effect. MOAs allow military aircraft to practice maneuvers and tactical flight training at  
46 airspeeds in excess of 250 knots indicated airspeed (approximately 285 mph). The FAA requires publication  
47 of the hours of operation for any MOA so that all pilots, both military and civilian, are aware of when other  
48 aircraft could be in the airspace. ATCAAs are assigned to Air Traffic Control (ATC) to segregate air traffic  
49 between specified activities being conducted within the assigned airspace and other IFR traffic. ATCAA is  
50 the equivalent of a MOA at 18,000 ft MSL and above. This airspace is not depicted on any chart but is often  
51 an extension of a MOA to higher altitudes and usually referred to by the same name. This airspace remains  
52 under control of the FAA when not in use to support general aviation activities. A Warning Area is airspace  
53 of defined dimensions that extends from 3 nautical miles (NM) outward from the coast of the United States  
54 and may be over US waters, international waters, or both. The purpose of Warning Areas is to warn  
55 nonparticipating pilots of potentially hazardous activity. Warning Areas may be used for other purposes if

1 released to the FAA during periods when not required for their intended purpose and are within areas in  
2 which the FAA has ATC authority.

3  
4 Each military organization responsible for a MOA develops a daily use schedule. Although the FAA  
5 designates MOAs for military use, other pilots may transit the airspace under VFR. MOAs and Warning  
6 Areas exist to notify civil pilots under VFR where heavy volumes of military training exist which increases  
7 the chance of conflict and are generally avoided by VFR traffic. MOAs and Warning Areas in the vicinity of  
8 busy airports may have specific avoidance procedures that also apply to small private and municipal  
9 airfields. Such avoidance procedures are maintained for each MOA or Warning Area, and both civil and  
10 military aircrews build them into daily flight plans.

11  
12 In addition to the lower limits of charted airspace, all aircrews adhere to FAA avoidance rules. Aircraft must  
13 avoid congested areas of a city, town, settlement, or any open-air assembly of persons by 1,000 ft above  
14 the highest obstacle within a horizontal radius of 2,000 ft of the aircraft. Outside of congested areas, aircraft  
15 must avoid any person, vessel, vehicle, or structure by 500 ft. Operational commanders may establish  
16 additional avoidance restrictions under MOAs.

17  
18 The ROI for airspace use and management includes the Tyndall AFB airfield and environs as well as the  
19 special use airspace depicted on **Figures 1-4** and **1-5**.

20  
21  
22 **3.2.2 Existing Conditions – Tyndall Air Force Base**

23  
24 Tyndall AFB airfield operations are controlled and managed by the control tower within the tailored Class  
25 D airspace that extends from the airfield surface to 2,500 feet MSL within a 5.4-NM radius of the airfield.  
26 This area reverts to Class E airspace during weekend, holiday, and other advanced notice times when the  
27 tower is closed. This airfield has two 10,000-foot runways (14R/L and 32R/L) with an Instrument Landing  
28 System and Tactical Air Navigation System that provide a means for pilots to navigate to the assigned  
29 runway during marginal weather conditions and as required for pilot training. There is also a separate 7,000-  
30 foot runway that is used for drone operations, which are managed by ATC so as not to conflict with the  
31 parallel runway operations and other airspace uses. The tower and RAPCON coordinate the sequencing  
32 and separation of airfield arrivals and departures while transitioning between the Class D and terminal  
33 airspace areas.

34  
35 Tyndall AFB airfield operations have varied over the years due to aircraft realignments, pre/post-hurricane  
36 aircraft relocations, and other factors discussed in Chapter 2, which have affected this airfield's annual  
37 usage. A 2016 Air Installations Compatible Use Zones (AICUZ) Study noted that Tyndall AFB airfield  
38 operations over a 6-year period generally ranged from about 22,000 to 61,000 operations as shown in  
39 **Table 3-1**; this study projected 66,000 operations by 2018 (USAF, 2016a). Actual operations prior to the  
40 hurricane were approximately 66,000.

41  
42 **Table 3-1. Tyndall AFB Airfield Operations over Six-Year Period**

Calendar Year	Based Operations	Transient Operations	Total
2015	56,706	3,954	60,660
2014	45,795	3,286	49,081
2013	41,084	4,664	45,748
2012	19,141	2,656	21,797
2011	35,186	5,558	40,744
2010	48,555	6,513	55,068

43 Source: (USAF, 2016a)

1 3.2.3 *Existing Conditions – Airspace*  
2

3 The affected environment for airspace management includes the MOAs, ATCAAs, and Warning Areas  
4 where aircraft based at Eglin AFB perform training operations. Fighter aircraft assigned to Eglin AFB  
5 primarily train in the Eglin E MOA/ATCAA, the Rose Hill MOA/ATCAA, the Tyndall E MOA/ATCAA, the  
6 Tyndall B and H MOA/ATCAA, the Tyndall C MOA/ATCAA, Warning Areas W-151 and W-470, and  
7 Restricted Areas R-2419A and R-2519A (see **Figure 1-4** and **Figure 1-5**). The special use airspace is  
8 described in **Chapters 1** and **2**.  
9

10 3.3 NOISE  
11

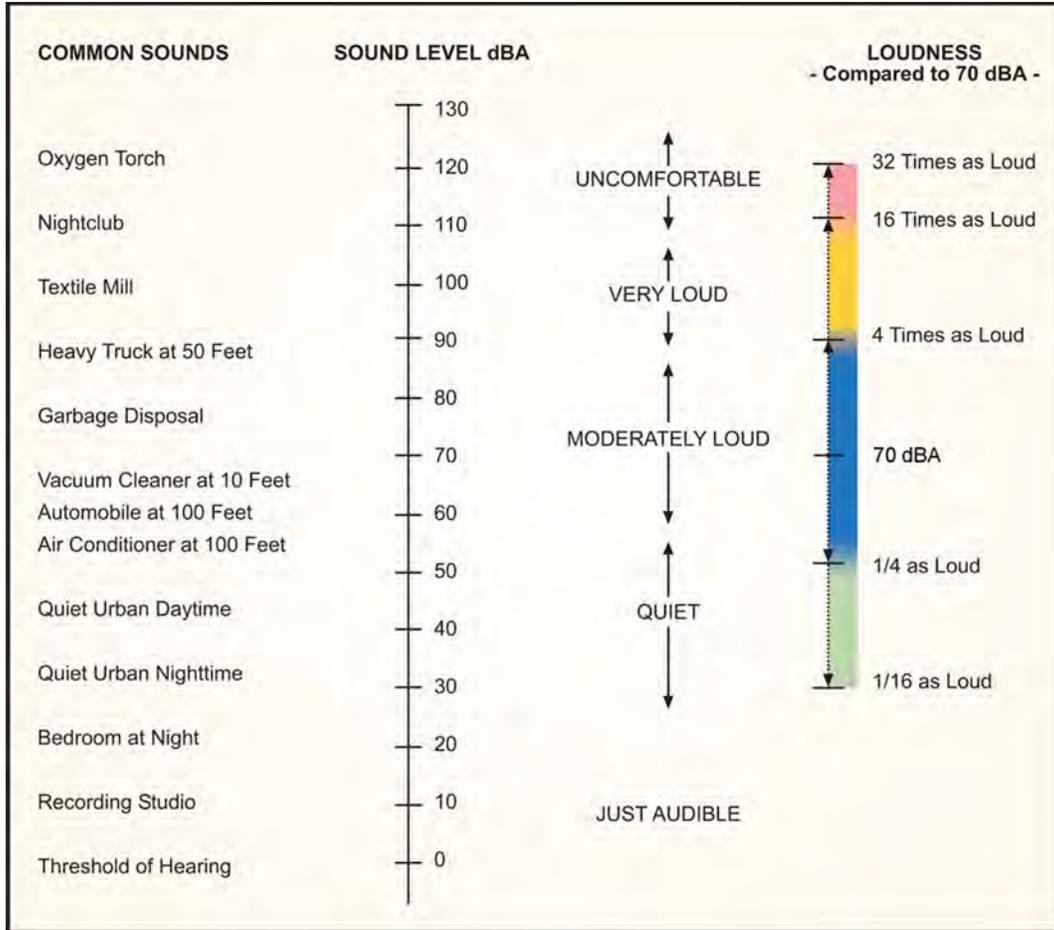
12 3.3.1 *Definition of the Resource*  
13

14 Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air  
15 or water, and are sensed by the human ear. Sound becomes noise when it is unwelcome and interferes  
16 with normal activities, such as sleep or conversation. Noise is generally described as unwanted sound.  
17 Unwanted sound can be based on objective effects (such as hearing loss or damage to structures) or  
18 subjective judgments (community annoyance). The response of different individuals to similar noise events  
19 is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness  
20 in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the  
21 individual. Noise also may affect wildlife through disruption of nesting, foraging, migration, and other life-  
22 cycle activities.  
23

24 Measured in decibels, sound intensity levels measures the relative magnitude of a sound. The decibel is a  
25 logarithmic unit of measurement that expresses the magnitude of a physical quantity, like sound, relative  
26 to a specified or implied reference level based on atmospheric pressure. Because decibel expresses a ratio  
27 of two quantities with the same unit, it is a dimensionless unit.  
28

29 All sounds have a spectral content, which means their magnitude or level changes with frequency, where  
30 frequency is measured in cycles per second, or hertz. To mimic the human ear's nonlinear sensitivity and  
31 perception of different frequencies of sound, the spectral content is weighted. For example, environmental  
32 noise measurements usually employ an "A-weighted" scale that filters out very low and very high  
33 frequencies to replicate human sensitivity. It is common to add the "A" to the measurement unit to identify  
34 that the measurement was made with this filtering process, for instance dBA. In this document, the dB unit  
35 refers to A-weighted sound levels unless otherwise noted.  
36

37 A-weighted sound levels from common sources are given on **Figure 3-1**. Some sources, like the air  
38 conditioner and vacuum cleaner, are continuous sounds whose levels are constant for some time. Some  
39 sources, like the automobile and heavy truck, are the maximum sound during an intermittent event like a  
40 vehicle pass-by. Some sources like "urban daytime" and "urban nighttime" are averages over extended  
41 periods. A variety of noise metrics have been developed to describe noise over different time periods.  
42  
43  
44



Source: Harris, 1979.

**Figure 3-1. Typical A-weighted Sound Levels of Common Sounds.**

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB; sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 to 140 dB are felt as pain (Berglund and Lindvall 1995). The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. On average, a person perceives a doubling (or halving) of a sound's loudness when there is a 10 dB change in sound level.

Military aircraft generate two types of sound. One is subsonic noise, which is continuous sound generated by the aircraft's engines and also by air flowing over the aircraft itself. Subsonic noise occurs at the airfields and in the airspace. The other type is supersonic noise consisting of sonic booms. Sonic booms are transient, impulsive sounds generated during supersonic flight. Supersonic flight must occur only within authorized airspace. These two types of noise differ in terms of characteristics.

Aircraft subsonic noise consists of two major types of sound events: flight events (including takeoffs, landings, and flyovers) and stationary events, such as engine maintenance run-ups. Noise from aircraft overflights typically occurs beneath main approach and departure paths and in local air traffic patterns around the airfield. Noise from stationary events typically occurs in areas near aircraft parking ramps and staging areas. As aircraft climb, the noise received on the ground drops to lower levels, eventually fading into the background or ambient levels.

Aircraft in supersonic flight (i.e., exceeding the speed of sound, Mach 1) cause sonic booms. A sonic boom is characterized by a rapid increase in pressure, followed by a decrease before a second rapid return to

1 normal atmospheric levels. This change occurs very quickly, usually within a few tenths of a second. It is  
2 usually perceived as a “bang-bang” sound. The amplitude of a sonic boom is measured by its peak  
3 overpressure, in pounds per square foot (psf). The amplitude depends on the aircraft’s size, weight,  
4 geometry, Mach number, and flight altitude. Altitude is usually the biggest single factor. Maneuvers (turns,  
5 dives, etc.) also affect the amplitude of particular booms.  
6

7 Not all supersonic flights cause sonic booms that are heard at ground level. As altitude increases, air  
8 temperature and sound speed decrease. These sound speed changes cause booms to be turned upward  
9 as they travel toward the ground. Depending on the altitude of the aircraft and the Mach number, many  
10 sonic booms can be bent upward such that they never reach the ground. This phenomenon, referred to as  
11 “cutoff,” also acts to limit the width (area covered) of the sonic booms that do reach the ground. The  
12 overpressures of booms that reach the ground are well below those that would begin to cause physical  
13 injury to humans or animals (see **Appendix B-1**). They can, however, be annoying and can cause startle  
14 reaction in humans and animals. On occasion, sonic booms can cause physical damage (e.g., to a window)  
15 if the overpressure is of sufficient magnitude. The condition of the structure is a major factor when damage  
16 occurs, the probability of which, tends to be low. For example, the probability of a 1-psf boom (average  
17 pressure in the airspace) cracking plaster or breaking a window falls in the range of 1 in 10,000 to 1 in  
18 10 million.  
19

### 20 3.3.1.1 Noise Metrics

21  
22 Noise metrics quantify sounds, so they can be compared with each other, and with their effects, in a  
23 standard way. There are a number of metrics that can be used to describe a range of situations, from a  
24 particular individual event to the cumulative effect of all noise events over a long time. This section  
25 summarizes the metrics relevant to environmental noise analysis. Noise metrics and noise models are  
26 described in **Appendix B-1**.  
27

1 **Single Event Metrics**

2  
3 *Maximum Sound Level*

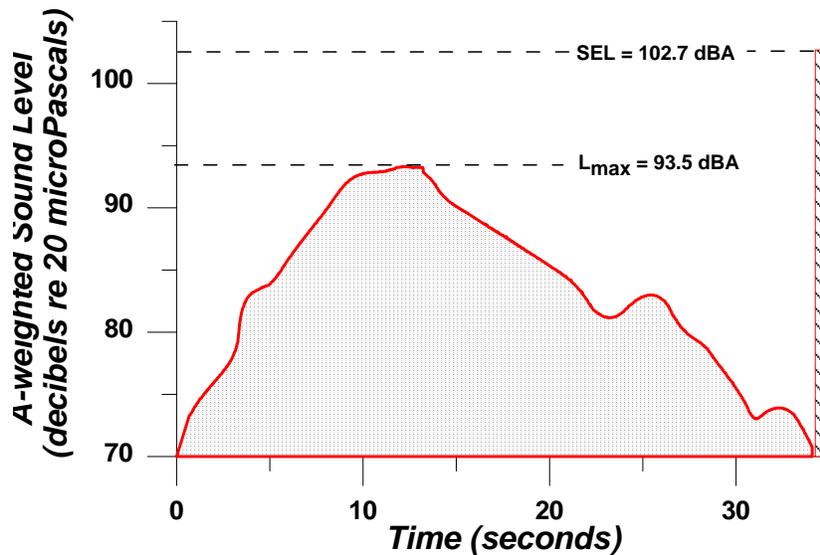
4  
5 The highest A-weighted sound level measured during a single event in which the sound changes with time  
6 is called the maximum A-weighted sound level or Maximum Sound Level and is abbreviated  $L_{max}$ . The  $L_{max}$   
7 is depicted for a sample event on **Figure 3-2**.

8  
9  $L_{max}$  is the maximum level that occurs over a fraction of a second. For aircraft noise, the “fraction of a  
10 second” is one-eighth of a second, denoted as “fast” response on a sound level measuring meter (American  
11 National Standards Institute 1988). Slowly varying or steady sounds are generally measured over 1 second,  
12 denoted “slow” response.  $L_{max}$  is important in judging if a noise event will interfere with conversation,  
13 television or radio listening, or other common activities. Although it provides some measure of the event, it  
14 does not fully describe the noise, because it does not account for how long the sound is heard.

15  
16 *Sound Exposure Level*

17  
18 Sound Exposure Level (SEL) combines both the intensity of a sound and its duration. For an aircraft flyover,  
19 SEL includes the maximum and all lower noise levels produced as part of the overflight, together with how  
20 long each part lasts. It represents the total sound energy in the event. **Figure 3-2** indicates the SEL for an  
21 example event, representing it as if all the sound energy were contained within 1 second.

22  
23 Because aircraft noise events last more than a few seconds, the SEL value is larger than  $L_{max}$ . It does not  
24 directly represent the sound level heard at any given time, but rather the entire event. SEL provides a much  
25 better measure of aircraft flyover noise exposure than  $L_{max}$  alone.



28  
29 **Figure 3-2. Example of Maximum Sound Level and Sound Exposure Level from an Individual**  
30 **Event.**

31  
32  
33 *Overpressure*

34  
35 The single event metrics commonly used to assess supersonic noise are overpressure in psf and  
36 C-Weighted Sound Exposure Level (CSEL). Overpressure is the peak pressure at any location within the  
37 sonic boom footprint.

1 *C-Weighted Sound Exposure Level*

2  
3 CSEL is SEL computed with C frequency weighting, which is similar to A-Weighting (discussed in  
4 **Section 3.2.1**) except that C weighting places more emphasis on low frequencies below 1,000 hertz.

5  
6 **Cumulative Metrics**

7  
8 *Equivalent Sound Level*

9  
10 Equivalent Sound Level ( $L_{eq}$ ) is a “cumulative” metric that combines a series of noise events over a period  
11 of time.  $L_{eq}$  is the sound level that represents the decibel average SEL of all sounds in the time period. Just  
12 as SEL has proven to be a good measure of a single event,  $L_{eq}$  has proven to be a good measure of series  
13 of events during a given time period.

14  
15 The time period of an  $L_{eq}$  measurement is usually related to some activity and is given along with the value.  
16 The time period is often shown in parenthesis (e.g.,  $L_{eq[24]}$  for 24 hours). The  $L_{eq}$  from 7:00 a.m. to 3:00 p.m.  
17 may give noise exposure for a school day.

18  
19 An example of  $L_{eq(24)}$  using notional hourly average noise levels ( $L_{eq[h]}$ ) for each hour of the day is given on  
20 **Figure 3-3**. The  $L_{eq(24)}$  for this example is 61 dB.

21  
22 *Day-Night Average Sound Level*

23  
24 Day-Night Average Sound Level (DNL) is a cumulative metric that accounts for all noise events in a 24-hour  
25 period; however, unlike  $L_{eq(24)}$ , DNL contains a nighttime noise penalty. To account for our increased  
26 sensitivity to noise at night, DNL applies a 10-dB penalty to events during the nighttime period, defined as  
27 10:00 p.m. to 7:00 a.m. The notations DNL and  $L_{dn}$  are both used for Day-Night Average Sound Level and  
28 are equivalent. For airports and military airfields, DNL represents the average sound level for annual  
29 average daily aircraft events.

30  
31 An example of DNL using notional hourly average noise levels ( $L_{eq[h]}$ ) for each hour of the day is given on  
32 **Figure 3-3**. Note the  $L_{eq(h)}$  for the hours between 10:00 p.m. and 7:00 a.m. have a 10-dB penalty assigned.  
33 DNL for the example noise distribution shown on **Figure 3-3** is 65 dBA.

34  
35 DNL does not represent a noise level heard at any given time but represents long-term exposure. Scientific  
36 studies have found good correlation between the percentages of groups of people highly annoyed and the  
37 level of average noise exposure measured in DNL (Schultz, 1978; US Environmental Protection Agency  
38 [USEPA], 1978).

39  
40 *Onset-Rate Adjusted Monthly Day-Night Average Sound Level*

41  
42 Military aircraft utilizing special use airspace such as military training routes, MOAs, and restricted  
43 areas/ranges generate a noise environment that is somewhat different from that around airfields. Rather  
44 than regularly occurring operations like at airfields, activity in special use airspace is highly sporadic. It is  
45 often seasonal, ranging from 10 per hour to less than 1 per week. Individual military overflight events also  
46 differ from typical community noise events in that noise from a low-altitude, high-air-speed flyover can have  
47 a rather sudden onset, with rates of up to 150 dB per second.

48  
49 The cumulative daily noise metric devised to account for the “surprise” effect of the sudden onset of aircraft  
50 noise events on humans and the sporadic nature of special use airspace activity is the Onset-Rate Adjusted  
51 Monthly Day-Night Average Sound Level ( $L_{dnmr}$ ). Onset rates between 15 and 150 dB per second require  
52 an adjustment of 0 to 11 dB to the event’s SEL, while onset rates below 15 dB per second require no  
53 adjustment to the event’s SEL (Stusnick et al., 1992). The term ‘monthly’ in  $L_{dnmr}$  refers to the noise  
54 assessment being conducted for the month with the most operations or sorties, the busiest month.

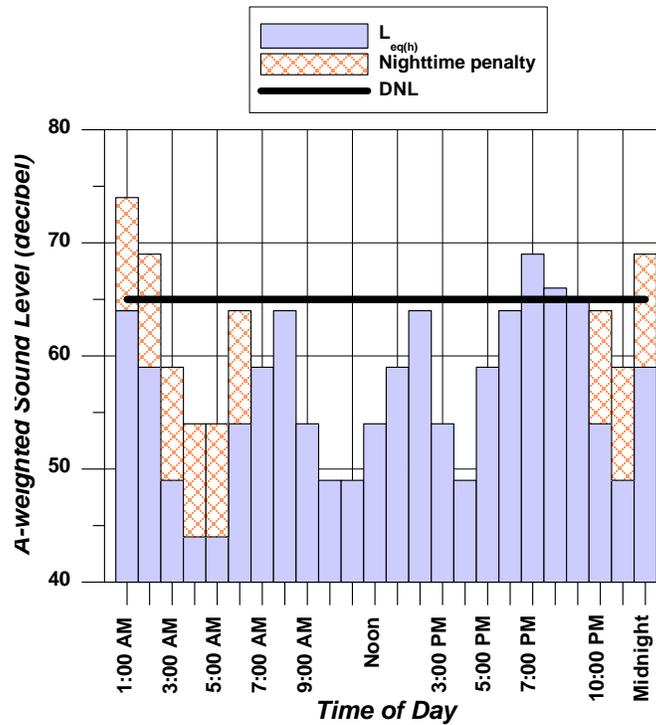


Figure 3-3. Example of Day-Night Average Sound Level Computed from Hourly Average Sound Levels.

### 3.3.1.2 Noise Models

This section summarizes the analysis tools used to calculate the noise levels for the EIAP.

#### NOISEMAP

Analyses of aircraft noise exposure and compatible land uses around DOD airfield-like facilities are normally accomplished using a group of computer-based programs, collectively called NOISEMAP (Czech and Plotkin, 1998; Wasmer and Maunsell, 2006a, 2006b). The core computational program of the NOISEMAP suite is NMAP. In this report NMAP Version 7.3 was used to analyze aircraft operations and to generate noise contours.

#### MR\_NMAP

When the aircraft flight tracks are not well defined and are distributed over a wide area, such as in military training routes with wide corridors or MOAs, the Air Force uses the DOD-approved MR\_NMAP program (Lucas and Calamia, 1997). In this report, MR\_NMAP Version 3.0 was used to model subsonic aircraft noise in special use airspace. For airspace environments where noise levels are calculated to be less than 45 dB, the noise levels are stated as “<45 dB.”

#### PCBoom

Environmental analysis of supersonic aircraft operations requires calculation of sonic boom amplitudes. For the purposes of this study, the Air Force and DOD-approved PCBoom program was used to assess sonic boom exposure due to military aircraft operations in supersonic airspace. In this report, PCBoom Version 4 was used to calculate sonic boom overpressure footprints and ground signatures from supersonic vehicles performing steady, level flight operations (Plotkin, 2002).

**BooMap**

For cumulative sonic boom exposure under supersonic air combat training arenas, the Air Force and DOD-approved BooMap program was used. In this report, BooMap96 was used to calculate cumulative C-weighted DNL (CDNL) exposure based on long-term measurements in a number of airspaces (Plotkin, 1993).

The ROI for noise includes the Tyndall AFB airfield and environs as well as the MOAs and Warning Areas depicted on **Figures 1-4 and 1-5**. Noise analysis at Tyndall AFB was conducted to update the airfield noise contours and the MOAs and Warning Areas described in **Section 3.1.2**, in order to reflect the most recent and accurate aircraft operations and flying conditions.

**3.3.2 Existing Conditions – Tyndall Air Force Base**

The discussion of the acoustic affected environment is divided into sections, each covering: aircraft operations before the 2018 hurricane for context and comparison purposes only and existing aircraft operations, which are the basis of the No Action Alternative for the Proposed Action at Tyndall AFB.

**3.2.2.1 Conditions Prior to Hurricane Michael in 2018**

Noise levels prior to Hurricane Michael were presented in the 2016 AICUZ study and represent operations predominated by the F-22A aircraft (Air Force, 2016c). They are presented here to serve as a comparison to existing noise levels, or those levels without a majority of the F-22 aircraft. Annual aircraft operations at Tyndall AFB prior to the 2018 hurricane totaled 66,360 operations, as summarized in **Table 3-2**. An operation is defined as a single takeoff or landing. Closed patterns consist of two operations, one departure and one arrival (e.g., two closed pattern circuits consist of four total operations). The table pattern numbers are operation counts, not pattern circuit counts. Tyndall AFB's runways 14L, 14R, 32L, 32R, 01, and 19 are used for military aircraft operations. Runways 01 and 19 are used exclusively by 53d Weapons Evaluation Group QF-16 aircraft. The majority of aircraft operations at Tyndall AFB were and continue to be performed on runway 14L and 32R. A more detailed annual aircraft operations table can be found in **Appendix B-2**.

**Table 3-2. Pre-Hurricane Annual Aircraft Operations Summary at Tyndall Air Force Base**

Aircraft	Departures		Arrivals		Closed Patterns		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
F-22A	7,769	39	7,769	39	22,190	112	37,728	190	37,918
T-38A	5,314	54	5,314	54	1,063	11	11,691	119	11,810
Other Based	2,902	20	2,896	26	1,127	7	6,925	53	6,978
Transient F-35A	35	0	35	0	6,830	0	6,900	0	6,900
Other Transients	1,209	24	1,209	24	277	11	2,695	59	2,754
<b>Grand Total</b>	<b>17,229</b>	<b>137</b>	<b>17,223</b>	<b>143</b>	<b>31,487</b>	<b>141</b>	<b>65,939</b>	<b>421</b>	<b>66,360</b>

Pre-hurricane, the resultant 65- to 85-dBA DNL contours in 5-dBA increments are shown on **Figure 3-4**. In accordance with AFI 32-7084, the 65-dBA DNL is the noise level below which generally all land uses are compatible with noise from aircraft operations. It should be emphasized that these noise levels, which are often shown graphically as contours on maps, are not discrete lines that sharply divide louder areas from land largely unaffected by noise. Instead, they are part of a planning tool that depicts the general noise environment around the installation based on typical aviation activities. Areas beyond 65-dBA DNL can also experience levels of appreciable noise depending upon training intensity or weather conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational tempo due to unit deployments, funding levels, and other factors. Static run-up operations, such as maintenance and pre/post

1 flight run-ups, were also modeled. A more detailed discussion of run-up operations at Tyndall AFB can be  
2 found in **Appendix B-2**.

3  
4 Prior to the hurricane, the prominent features from **Figure 3-4** are the extents of the DNL contours off the  
5 East Peninsula. The only portions of the 65-dBA DNL contour to touch the mainland are just south of  
6 Panama City and the Highway 98 bridge. The 65-dBA contour extends beyond the base boundary,  
7 approximately 5.9 mi to the southeast from the end of runway 14L and 5.0 mi to the northwest from the end  
8 of runway 32L. The 75-dBA DNL contour extends approximately 2 and 3 mi from runways 14L and 32L,  
9 respectively. The area within each DNL noise contour for the conditions prior to the hurricane are identified  
10 on **Figure 3-4** and shown in **Table 3-3**.

11  
12 **Table 3-3. Day-Night Average Sound Level Area Affected at Tyndall Air Force Base**

Noise Level (dBA DNL)	Area Within Noise Contour (acres)	
	Pre-Hurricane	Existing
65-70	18,382	10,031
70-75	8,566	2,297
75-80	3,018	1,066
80-85	1,114	442
>85	797	723

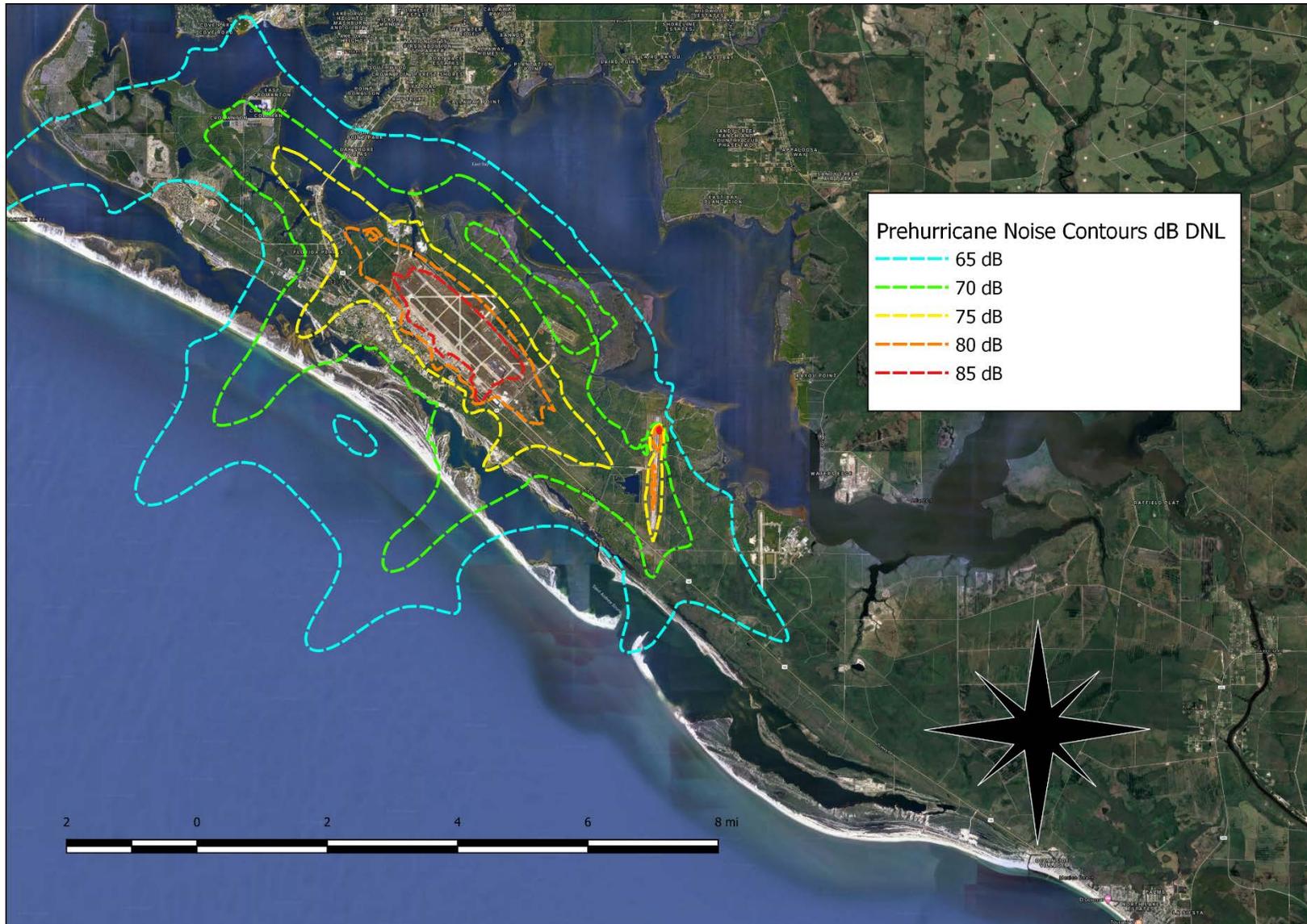
13 Notes:

14 Area (on- and off-base) was based off NOISEMAP modeled noise contours and used to calculate the  
15 amount of land within each noise contour..

16 dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level

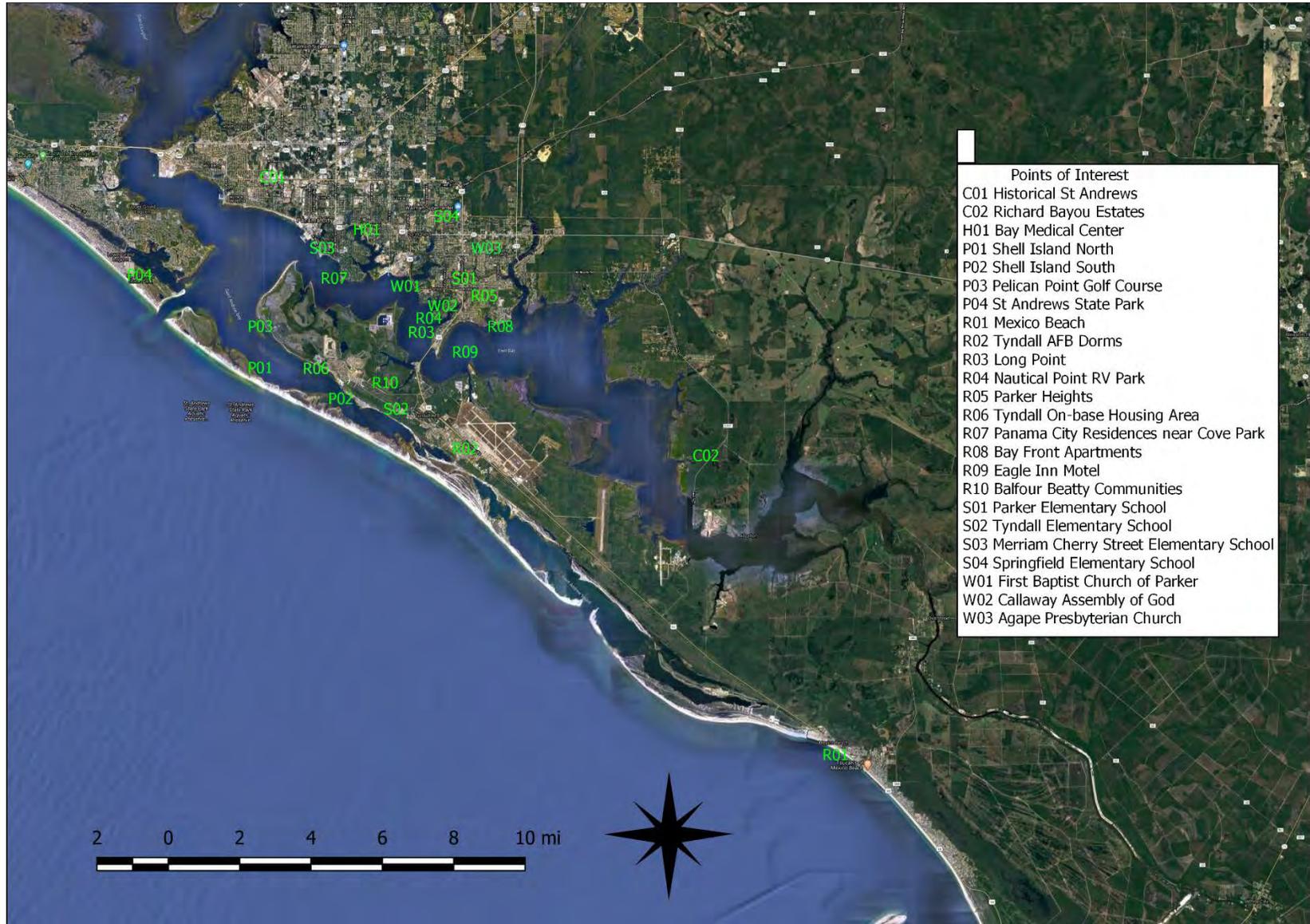
17  
18  
19 A number of points of interest (POIs) were identified in the vicinity  
20 of Tyndall AFB. These POIs (as shown on **Figure 3-5**) are made  
21 up of noise sensitive receptors such as homes, schools, hospitals,  
22 and places of worship. **Table 3-4** lists the DNL as a result of  
23 aircraft operations at Tyndall AFB at the 24 POIs prior to  
24 Hurricane Michael. Two POIs were exposed to DNL above 70  
25 dBA. Both of these locations are within Tyndall AFB's boundaries.  
26 The only off-base POIs with a DNL above 65 dBA were Long  
27 Point, and Eagle Inn Motel located on the opposite side of the  
28 Highway 98 Bridge from Tyndall AFB.

THE FIRST STEP IN IDENTIFYING NOISE SENSITIVE RECEPTORS, ALSO REFERRED TO AS POINTS OF INTEREST (POIs) AROUND MILITARY AIRFIELDS IS TO REVIEW PUBLISHED NATIONAL ENVIRONMENTAL POLICY ACT AND/OR AIR INSTALLATION COMPATIBLE USE ZONE REPORTS TO DETERMINE PREVIOUSLY IDENTIFIED POIs. THESE TYPICALLY INCLUDE SCHOOLS, PLACES OF WORSHIP, AND RESIDENTIAL AREAS AROUND THE AIRFIELD. IN ADDITION, INSTALLATION PERSONNEL WORK WITH THE COMMUNITY TO IDENTIFY AREAS AROUND THE AIRFIELD THAT SHOULD BE CONSIDERED FOR NOISE ANALYSIS.



1  
2 Source: Google EarthPro 2020.

3 **Figure 3-4. Pre-Hurricane Day-Night Average Sound Level Contours at Tyndall Air Force Base.**



1 Source: Google EarthPro 2020.

3 **Figure 3-5. Points of Interest Identified Near Tyndall Air Force Base.**

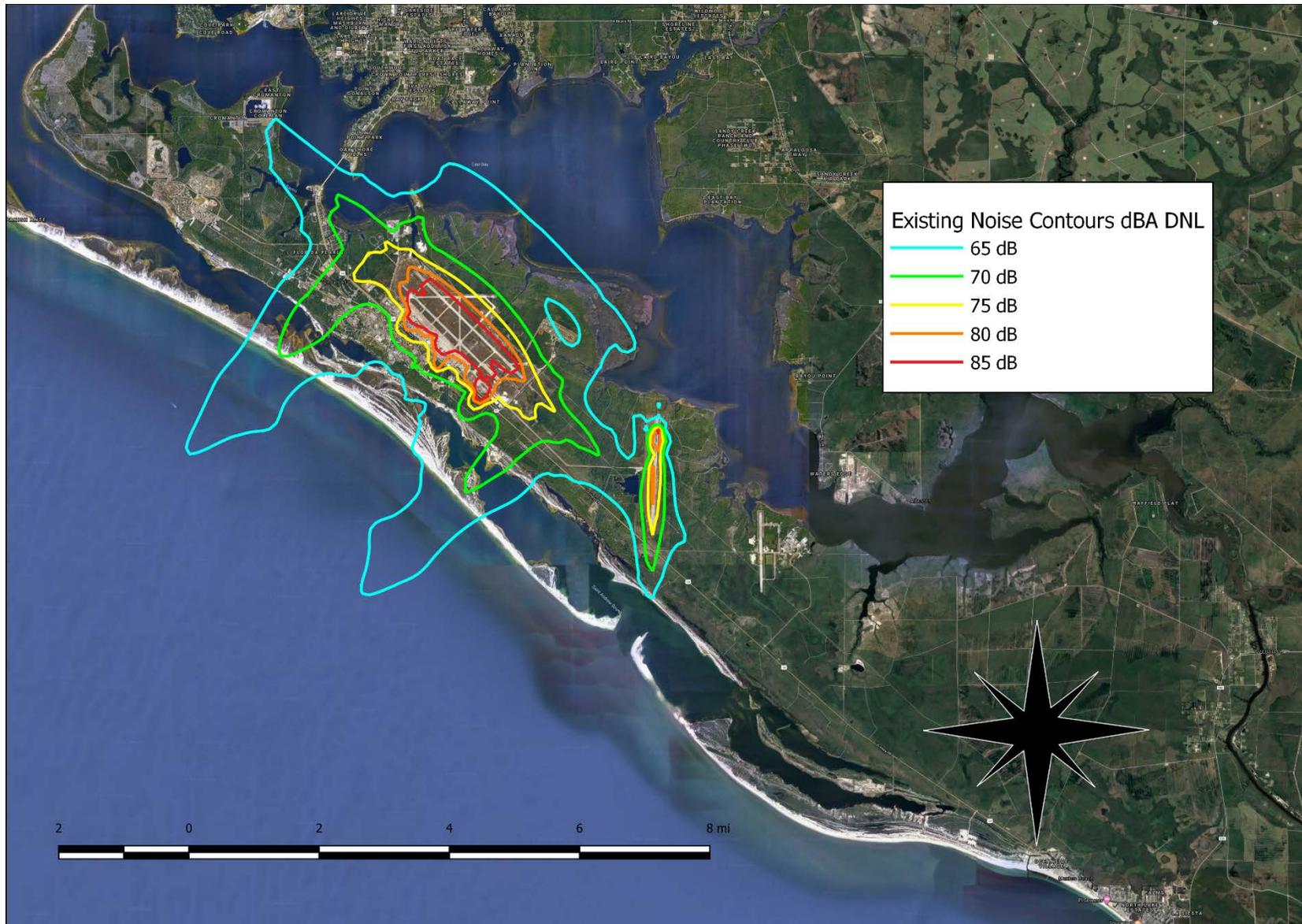
**Table 3-4. Pre-Hurricane Day-Night Average Sound Level at Points of Interest at Tyndall Air Force Base**

Points of Interest		DNL (dBA)
ID	Description	
C01	Historical St Andrews	50
C02	Richard Bayou Estates	58
H01	Bay Medical Center	56
P01	Shell Island North	65
P02	Shell Island South	64
P03	Pelican Point Golf Course	66
P04	St Andrews State Park	48
R01	Mexico Beach	55
R02	Tyndall AFB Dorms	76
R03	Long Point	66
R04	Nautical Point RV Park	62
R05	Parker Heights	59
R06	Tyndall On-base Housing Area	64
R07	Panama City Residences near Cove Park	64
R08	Bay Front Apartments	61
R09	Eagle Inn Motel	67
R10	Balfour Beatty Communities	62
S01	Parker Elementary School	55
S02	Tyndall Elementary School	74
S03	Merriam Cherry Street Elementary School	58
S04	Springfield Elementary School	59
W01	First Baptist Church of Parker	59
W02	Callaway Assembly of God	51
W03	Agape Presbyterian Church	60

Notes:  
 Affected POIs, identified prior to Hurricane Michael, were based off NOISEMAP-modeled noise contours and used to calculate the POIs within each noise contour.  
 AFB = Air Force Base; dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level; POI = point of interest

**3.2.2.2 Existing Conditions Post-Hurricane Michael**

After Hurricane Michael, all Tyndall AFB-based F-22 and T-38 aircraft operations stopped, resulting in a dramatic decrease in operations tempo and noise levels. Although F-22 aircraft are no longer based at Tyndall AFB, F-22 aircraft continue to visit Tyndall AFB at a rate of about one per week for aircraft-specific maintenance purposes. Other aircraft types continue to operate at the installation more-or-less as they had prior to the hurricane. Existing annual aircraft operations at Tyndall AFB are summarized in **Table 3-5**. Noise levels reflecting existing conditions are shown in **Figure 3-6**. Following the figure, **Table 3-6** provides a comparison of noise levels pre- and post-hurricane on POIs. As shown, noise levels at the Tyndall AFB Dorms exceed 65 dB DNL under existing, post-hurricane conditions.



1  
2 **Figure 3-6 Existing Conditions Day-Night Average Sound Level Contours at Tyndall Air Force Base.**  
3 *Source:* Google EarthPro 2020.

**Table 3-5. Existing Annual Aircraft Operations Summary at Tyndall Air Force Base**

Aircraft	Departures		Arrivals		Closed Patterns		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
Based Aircraft	2,902	20	2,896	26	1,131	7	6,929	53	6,982
Transient F-22A	48	0	1,407	7	10,051	51	11,506	58	11,564
Transient F-35A	35	0	35	0	6,830	0	6,999	0	6,999
Other Transients	1,090	20	1,090	20	277	11	2,457	51	2,508
<b>Grand Total</b>	<b>4,075</b>	<b>40</b>	<b>5,428</b>	<b>53</b>	<b>18,289</b>	<b>69</b>	<b>27,891</b>	<b>162</b>	<b>28,053</b>

**Table 3-6. Day-Night Average Sound Level at Points of Interest Under Pre-Hurricane and Existing Conditions**

Points of Interest		Pre-Hurricane	Existing
ID	Description		
C01	Historical St Andrews	50	48
C02	Richard Bayou Estates	58	50
H01	Bay Medical Center	56	51
P01	Shell Island North	65	53
P02	Shell Island South	64	60
P03	Pelican Point Golf Course	66	54
P04	St Andrews State Park	48	42
R01	Mexico Beach	55	47
R02	Tyndall AFB Dorms	76	71
R03	Long Point	66	59
R04	Nautical Point RV Park	62	56
R05	Parker Heights	59	54
R06	Tyndall On-base Housing Area	64	56
R07	Panama City Residences near Cove Park	64	59
R08	Bay Front Apartments	61	56
R09	Eagle Inn Motel	67	61
R10	Balfour Beatty Communities	62	54
S01	Parker Elementary School	55	48
S02	Tyndall Elementary School	74	70
S03	Merriam Cherry Street Elementary School	58	52
S04	Springfield Elementary School	59	46
W01	First Baptist Church of Parker	59	51
W02	Callaway Assembly of God	51	43
W03	Agape Presbyterian Church	60	54

Notes:

Affected POIs, identified prior to Hurricane Michael, were based off NOISEMAP-modeled noise contours and used to calculate the POIs within each noise contour.

AFB = Air Force Base; dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level; POI = point of interest

The DNL metric is useful for describing the noise environment at a location with a single number, but it does not provide a complete description of the noise environment. In accordance with current DoD policy, this EA uses several supplemental noise metrics (e.g., number of events with potential to interfere with speech in residential areas, noise interference with classroom learning) to provide an expanded description of the noise experience.

1 For the purposes of this analysis, it was conservatively assumed that any event exceeding 50 dB has some  
 2 potential to interfere at least momentarily with speech and other forms of communication involving listening.  
 3 Please note that flight paths are variable and speech-interference events sometimes occur far from  
 4 standard flight patterns. As presented in **Table 3-7**, the number of noise events per average daytime hour  
 5 with the potential to interfere with outdoor speech ranges from less than one per hour at one of the 20 POIs,  
 6 and up to three events per hour at 19 of the POIs, and close to ten per hour at one POI (Tyndall AFB  
 7 Dorms) under existing conditions. When compared to pre-hurricane conditions, the number of speech  
 8 interference events per hour were greater pre-hurricane than is found now.

9  
 10 **Table 3-7. Number of Outdoor Noise Events With Potential to Interfere With Speech Under Pre-  
 Hurricane and Existing Conditions**

Points of Interest		Pre-Hurricane Events	Existing Events
ID	Description		
C01	Historical St Andrews	1.6	0.8
C02	Richard Bayou Estates	5.8	1.9
H01	Bay Medical Center	3.6	1.5
P01	Shell Island North	3.7	1.1
P02	Shell Island South	5.2	1.7
P03	Pelican Point Golf Course	3.8	1.5
P04	St Andrews State Park	1.9	0.8
R01	Mexico Beach	2.4	0.6
R02	Tyndall AFB Dorms	14.5	9.4
R03	Long Point	7.3	3.0
R04	Nautical Point RV Park	7.2	2.9
R05	Parker Heights	6.6	2.3
R06	Tyndall On-base Housing Area	7.2	3.2
R07	Panama City Residences near Cove Park	5.1	2.3
R08	Bay Front Apartments	6.6	2.3
R09	Eagle Inn Motel	7.3	3.1
R10	Balfour Beatty Communities	1.6	3.3
W01	First Baptist Church of Parker	3.5	2.3
W02	Callaway Assembly of God	6.4	1.6
W03	Agape Presbyterian Church	4.7	2.6

12  
 13 Nighttime flying, which is required as training for certain missions, has an increased likelihood of causing  
 14 sleep disturbance. The lack of quality sleep has the potential to affect health and concentration. The  
 15 probability of being awakened at least once per night was calculated using a method described by the  
 16 American National Standards Institute (American National Standards Institute, 2008). The method first  
 17 predicts the probability of awakening associated with each type of flying event (higher SELs yield higher  
 18 probability of awakening) and then sums the probabilities associated with all event types. The overall  
 19 probability of awakening at least once per night reflects all flying events that occur between 10:00 p.m. and  
 20 7:00 a.m., when most people sleep (**Table 3-8**). The analysis also accounts for standard building  
 21 attenuation of 15 dB and 25 dB with windows open and closed, respectively. Sleep disturbance probabilities  
 22 listed for parks are not intended to imply that people regularly sleep in parks, but instead are indicative of  
 23 impacts in nearby residential areas. Flight operations between 10:00 p.m. and 7:00 a.m. made up less than  
 24 1 percent of total operations under pre- and post-hurricane conditions. The estimated percentage of people  
 25 awakened at least once per night by aircraft noise is less than 1 percent under existing and pre-hurricane  
 26 conditions.

**Table 3-8. Percent Probability of People Awakened by Aircraft Noise at Least Once Per Night Pre-Hurricane and Existing Conditions at Points of Interest**

Points of Interest		Pre-Hurricane (%)	Existing (%)
ID	Description		
P01	Shell Island North	0.2	0
P04	St Andrews State Park	0.3	0
R01	Mexico Beach	0.2	0.1
R02	Tyndall AFB Dorms	0.3	0.1
R03	Long Point	0.4	0.1
R04	Nautical Point RV Park	0.3	0.1
R05	Parker Heights	0.3	0.1
R06	Tyndall On-base Housing Area	0.3	0.1
R07	Panama City Residences near Cove Park	0.1	0.1
R08	Bay Front Apartments	0.3	0.1
R09	Eagle Inn Motel	0.3	0.1
R10	Balfour Beatty Communities	0.3	0.1

Noise interference with learning in schools is of particular concern because noise can interrupt communication or interfere with concentration. The DoD Noise Working Group guidelines recommend that exterior noise levels during the school day not exceed 60 dB 8-hour equivalent noise level ( $L_{eq-8hr}$ ), as that would indicate that interior classroom noise levels likely exceed a recommended 40 dB maximum background noise level (DoD Noise Working Group, 2013a). As presented in **Table 3-9**, exterior school-day noise levels are below the 60 dB  $L_{eq-8hr}$  criteria level at all schools except Tyndall Elementary School under pre-hurricane and existing conditions. Under existing, post-hurricane conditions, the number of events at Tyndall Elementary School with potential to interfere with speech per average daytime hour is close to three, with windows open or closed. Under pre-hurricane conditions, which are described for a point of reference, the number of events with potential to interfere with speech at Tyndall Elementary School was a little more than six events per hour with windows open and about four with windows closed.

**Table 3-9. Noise Levels at Schools Near Tyndall Air Force Base under Pre-Hurricane and Existing Conditions**

Location Description	Outdoor $L_{eq-8hr}$		Speech-Interference Events per Hour with Windows Open		Speech-Interference Events per Hour with Windows Closed	
	Pre-Hurricane	Existing	Pre-Hurricane	Existing	Pre-Hurricane	Existing
Parker Elementary School	< 60 dB	< 60 dB	1.8	< 1	< 1	< 1
Tyndall Elementary School	76	73	6.4	3.2	4.3	1.4
Merriam Cherry Street Elementary School	< 60 dB	60.3 dB	1.5	< 1	< 1	< 1
Springfield Elementary School	< 60 dB	60.4 dB	< 1	< 1	< 1	< 1

Notes: NA=Not Applicable

Another analysis in terms of learning is the Number-of-Events Above (NA) metric. This gives the total number of events that exceed a noise level threshold (L) during a specified period of time. Combined with the selected threshold, the metric is denoted NAL. The threshold can be either SEL or  $L_{max}$ , and it is important that this selection is shown in the nomenclature. When labeling a contour line or POI, (NA) a Threshold Level (NAL) is followed by the number of events in parentheses. For example, if there were 10 events that exceed an SEL of 50 dB over a given period of time (in this analysis it is 8 hours, which represent a school day), the nomenclature would be NA50SEL(10). Similarly, for  $L_{max}$  it would be written as NA50  $L_{max}$ (10).

1  
2 The NA metric is the only supplemental metric that combines single-event noise levels with the number of  
3 aircraft operations. In essence, it answers the question of how many aircraft (or range of aircraft) fly over a  
4 given location or area at or above a selected threshold noise level. It provides additional information about  
5 the acoustic environment and is valuable in helping to describe noise exposure to the community. A  
6 threshold level and metric are selected that best meet the need for each situation. An  $L_{max}$  threshold is  
7 normally selected to analyze speech interference, while an SEL threshold is normally selected for analysis  
8 of sleep disturbance.

9  
10 Under pre-hurricane conditions, the  $NA50L_{max}$  ranged from four events per hour at Tyndall Elementary  
11 School to less than one at the other three schools. Under existing conditions, Tyndall Elementary School  
12 experiences about one  $NA50L_{max}$  event per hour and the three other schools less than one per hour.

13  
14 DoD policy for assessing hearing loss risk in the community pursuant to NEPA is to use the 80-dB DNL  
15 noise contour to identify populations at the most risk of potential hearing loss (DoD Noise Working Group,  
16 2013b). No residences on or off base are exposed to noise levels exceeding 80 dB DNL under pre- and  
17 post-hurricane conditions. Therefore, the risk of noise-induced hearing loss in the community is small, and  
18 potential hearing loss calculation is not necessary.

### 19 20 3.3.3 Existing Conditions – Airspace

#### 21 22 3.3.3.1 Tyndall AFB Airspace

23  
24 For airspace noise conditions, no comparison to pre-hurricane and existing conditions are required.  
25 Airspace aircraft operations did not noticeably change as a result of Hurricane Michael. This is because the  
26 majority of F-22 operations moved from Tyndall AFB to Eglin AFB and aircraft out of Eglin AFB have  
27 historically shared this airspace with Tyndall AFB as well as others. Historically, the primary special use  
28 airspace used by Tyndall AFB aircraft are the Tyndall E, B/H, and C MOAs (and associated ATCAAs) and  
29 Warning Areas W-151 and W-470. Historically, Tyndall B/H MOA receives approximately 8 percent of  
30 sorties originating from Tyndall AFB while Tyndall C MOA receives approximately 22 percent, Tyndall E  
31 receives 30 percent, W-151 receives 10 percent, and W-470 receives 30 percent. A summary of Tyndall  
32 AFB's annual airspace operations is presented in **Table 3-10**. **Table 3-11** shows the existing  $L_{dnmr}$  noise  
33 levels, calculated using MR\_NMAP, from the subsonic aircraft operations detailed in **Table 3-10** underneath  
34 Warning Areas W-151 and W-470 and the Tyndall B/H, C, and E MOAs.

35  
36 Supersonic operations are allowed in Warning Areas W-151 and W-470 and the Tyndall B/H, C, and E  
37 MOAs (and associated ATCAAs) above 10,000 ft MSL. Airspace sorties require aircraft to exceed Mach  
38 1.0 (supersonic) for brief periods of time for approximately 10 percent of total flight time. This is equivalent  
39 to less than 5 minutes of supersonic flight activity per sortie.

40  
41 The BooMap program was used to compute cumulative sonic boom exposure under supersonic air combat  
42 training arenas. Under the existing conditions, the cumulative CDNL exposure in the special use airspace  
43 used by Tyndall AFB aircraft do not exceed the 45-dBA CDNL under any primary use airspace.

**Table 3-10. Existing Annual Airspace Operations Summary from Tyndall Air Force Base**

Aircraft	Tyndall B/H <sup>1</sup>		Tyndall C <sup>1</sup>		Tyndall E <sup>2</sup>		W-151		W-470		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Total
F-22	2,549	79	6,510	201	9,028	279	3,112	96	8,713	269	29,912	924	30,836
T-38A	1,753	54	4,476	138	6,207	192	2,139	66	5,991	185	20,566	635	21,201
<b>Grand Total</b>	<b>4,302</b>	<b>133</b>	<b>10,986</b>	<b>339</b>	<b>15,235</b>	<b>471</b>	<b>5,251</b>	<b>162</b>	<b>14,704</b>	<b>454</b>	<b>50,478</b>	<b>1,559</b>	<b>52,037</b>

Notes:

<sup>1</sup> The Compass Lake Air Traffic Control Assigned Airspace is within the same lateral confines as the Tyndall B and Tyndall C/H Military Operations Areas.

<sup>2</sup> The Carrabelle Air Traffic Control Assigned Airspace is within the same lateral confines as the Tyndall E Military Operations Area.

**Table 3-11. Existing Noise Levels in the Airspace**

Airspace	Noise Level (L <sub>dnmr</sub> dB)
Warning Area W-151	56
Warning Area W-470	60
Tyndall B and H MOAs	51
Tyndall C MOA	61
Tyndall E MOA	61

Notes:

dB = decibel(s); L<sub>dnmr</sub> = Onset-Rate Adjusted Monthly Day-Night Average Sound Level;

MOA = Military Operations Area

Single event sonic boom levels estimated for supersonic flights in the airspace noted above are shown in **Table 3-12**. Overpressure (psf) and CSEL (decibels) were estimated directly under the flight path for the F-22 and T-38A aircraft at various altitudes and Mach numbers. Overpressure levels estimated for these airspaces range from 6.2 to 0.9 psf depending on the flight conditions.

**Table 3-12. Warning Areas W-151 and W-470, Tyndall B/H, C, and E Military Operations Areas (Compass Lake Air Traffic Control Assigned Airspace): Sonic Boom Levels Undertrack for Aircraft in Level Flight at Mach 1.2 and 1.5**

Aircraft	Altitude (feet above mean sea level)			
	10,000	20,000	30,000	40,000
<b>Mach 1.2</b>				
<b>Overpressure (psf)</b>				
F-22	5.4	2.8	1.9	1.4
T-38A	3.3	1.8	1.2	0.9
<b>C-Weighted Sound Exposure Level (dB)<sup>1</sup></b>				
F-22	116	111	107	105
T-38A	112	107	103	101
<b>Mach 1.5</b>				
<b>Overpressure (psf)</b>				
F-22	6.2	3.2	2.1	1.5
T-38A	3.8	2.0	1.3	0.9
<b>C-Weighted Sound Exposure Level (dB)<sup>1</sup></b>				
F-22	117	112	108	105
T-38A	113	108	104	101

Note:

C-weighted Sound Exposure Level – Sound Exposure Level with frequency weighting that places more emphasis on low frequencies below 1,000 hertz

dB = decibels; psf = pounds per square foot

When sonic booms reach the ground, they impact an area that is referred to as a “carpet.” The size of the carpet depends on the supersonic flight path and on atmospheric conditions. The width of the boom carpet beneath the aircraft is about 1 mi for each 1,000 ft of altitude (National Aeronautics and Space Administration [NASA], 2017). Sonic booms are loudest near the center of the carpet, having a sharp “bang-bang” sound. Near the edges, they are weak and have a rumbling, sounding like distant thunder. The boom levels shown in **Table 3-12** are the loudest levels computed at the center of the carpet, directly under the flight path, for the constant Mach, level flight conditions indicated. The location of these booms would vary with changing flight paths and weather conditions, so it is unlikely that any given location would experience these undertrack levels more than once over multiple events. Public reaction (limited to vessels 15 NM from shore) is expected to occur with overpressures above 1 psf, and in rare instances, damage to structures have occurred at overpressures between 2 and 5 psf (NASA, 2017). People located farther away from the supersonic flight paths, who are still within the primary boom carpet, might also be exposed to levels that may be startling or annoying, but the probability of this decreases the farther away they are from the flight path. People located beyond the edge of the boom carpet are not expected to be exposed to sonic boom although post-boom rumbling sounds may be heard.

### 3.3.3.2 Eglin AFB Airspace

The primary special use airspace used by Eglin AFB-based aircraft are the Eglin E MOA/ATCAA, the Rose Hill MOA/ATCAA, and Warning Area W-151. The Eglin E MOA/ATCAA receives approximately 45 percent of all airspace operations originating from Eglin AFB, the Rose Hill MOA/ATCAA receives 10 percent, and Warning Area W-151 receives 45 percent. Minimal nighttime aircraft operations are performed in the listed airspaces. The F-22 and T-38 aircraft do not perform operations within the Eglin E or Rose Hill MOAs/ATCAAs. With the exception of Warning Area W-151, the majority of their annual operations occur in special use airspace not proposed for use by contract ADAIR training operations. A summary of Eglin

1 AFB's current annual airspace operations in the airspace proposed for contract ADAIR use is presented in  
2 **Table 3-13**.

3  
4 **Table 3-14** shows the existing  $L_{dnmr}$  noise levels, calculated using MR\_NMAP, from the subsonic aircraft  
5 operations detailed in **Table 3-13** underneath the special use airspace.  
6  
7

**Table 3-13. Existing Annual Airspace Operations Summary at Eglin Air Force Base**

Aircraft	Eglin E MOA	Rose Hill MOA	Warning Area W-151	Total Operations
F-35	2,374	527	2,374	5,275
F-15A/E	391	93	1,465	1,949
F-16C	633	124	1,012	1,769
F-18A/C	114	-	145	259
A-10A	84	-	84	168
F-22	-	-	3,208	3,208
T-38	-	-	2,205	2,205
<b>Grand Total</b>	<b>3,596</b>	<b>744</b>	<b>10,493</b>	<b>14,833</b>

8 Notes:  
9 MOA = Military Operations Area  
10  
11

**Table 3-14. Existing Noise Levels in the Airspace**

Airspace	Noise Level ( $L_{dnmr}$ dB)
Eglin E MOA	61
Rose Hill MOA	51
Warning Area W-151	61

12 Notes:  
13 dB = decibel(s);  $L_{dnmr}$  = Onset-Rate Adjusted Monthly Day-Night  
14 Average Sound Level; MOA = Military Operations Area  
15  
16

17 Supersonic operations are allowed in W-151 beyond 15 NM from land and above 10,000 ft MSL. Airspace  
18 sorties require aircraft to exceed Mach 1.0 (supersonic) for brief periods of time for approximately 10 percent  
19 of total flight time. This is equivalent to less than 5 minutes of supersonic flight activity per sortie.  
20

21 The BooMap program was used to compute cumulative sonic boom exposure under supersonic air combat  
22 training arenas. Under the existing conditions, the cumulative CDNL exposure in the special use airspace  
23 used by based Eglin AFB aircraft do not exceed the 45-dBA CDNL under any primary use airspace.  
24

25 Single event sonic boom levels estimated for supersonic flights in Warning Area W-151 are shown in  
26 **Table 3-15**. Overpressure (psf) and CSEL (dB) were estimated directly under the flight path for the F-35A/C,  
27 F-15C/E, and F-16C aircraft at various altitudes and Mach numbers. Overpressure levels estimated for  
28 these airspaces range from 6.2 to 1.1 psf depending on the flight conditions.  
29  
30

**Table 3-15. Warning Area W-151: Sonic Boom Levels Undertrack for Aircraft in Level Flight at Mach 1.2 and 1.5**

Aircraft	Altitude (feet above mean sea level)			
	10,000	20,000	30,000	40,000
<b>Mach 1.2</b>				
<b>Overpressure (psf)</b>				
F-35A	5.4	2.8	1.9	1.4
F-15A/E	5.2	2.8	1.8	1.4
F-16C	4.2	2.2	1.5	1.1
<b>C-Weighted Sound Exposure Level (dB)<sup>1</sup></b>				
F-35A	116	111	107	105
F-15A/E	116	110	107	105
F-16C	114	109	105	103
<b>Mach 1.5</b>				
<b>Overpressure (psf)</b>				
F-35A	6.2	3.2	2.1	1.5
F-15A/E	6.0	3.2	2.0	1.5
F-16C	4.9	2.5	1.6	1.2
<b>C-Weighted Sound Exposure Level (dB)<sup>1</sup></b>				
F-35A	117	112	108	105
F-15A/E	117	112	108	105
F-16C	115	110	106	103

Notes:

C-weighted Sound Exposure Level – Sound Exposure Level with frequency weighting that places more emphasis on low frequencies below 1,000 hertz

dB = decibel(s); psf = pounds per square foot

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### 3.4 SAFETY

#### 3.4.1 *Definition of the Resource*

Safety concerns associated with ground, explosive, and flight activities are considered in this section. Ground safety considers issues associated with ground operations and maintenance activities that support unit operations including arresting gear capability, jet blast/maintenance testing, and safety danger. Aircraft maintenance testing occurs in designated safety zones. Ground safety also considers the safety of personnel and facilities on the ground that may be placed at risk from flight operations in the vicinity of the airfield and in the airspace. CZs and Accident Potential Zones (APZs) around the airfield restrict the public's exposure to areas where there is a higher accident potential. Although ground and flight safety are addressed separately, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns.

Explosives safety relates to the management and safe use of ordnance and munitions. Flight safety considers aircraft flight risks such as midair collision, bird/wildlife-aircraft strike hazard (BASH), and in-flight emergency. Contractor planes would follow Air Force safety procedures and aircraft specific emergency procedures based on the aircraft design which are produced by the original equipment manufacturer of the aircraft. Basic airmanship procedures also exist for handling any deviations to ATC procedures due to an in-flight emergency; these procedures are defined in AFI 11-202 [Volume 3], *General Flight Rules*, and established aircraft flight manuals. The Flight Crew Information File is a safety resource for aircrew day-to-day operations which is composed of air and ground operation rules and procedures.

Existing conditions are organized by ground, explosive, and flight safety. The ROI includes Tyndall AFB and areas immediately adjacent to the base where ground and explosive safety concerns are described, as well as the airfield and airspace where flight safety is discussed.

1  
2  
3 **3.4.2 Existing Conditions – Tyndall Air Force Base and Airspace**  
4

5 **3.4.2.1 Ground Safety**  
6

7 Ground safety includes several categories including ground and industrial operations, operational activities,  
8 and motor vehicle use. Ground mishaps can occur from the use of equipment or materials and maintenance  
9 functions. Day-to-day operations and maintenance activities conducted by the 325 FW are performed in  
10 accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and  
11 standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements identified within  
12 AFI 91-202 (2019), *The US Air Force Mishap Prevention Program*, and AFMAN 91-203 (2018), *Air Force*  
13 *Occupational Safety, Fire, and Health Standards*.  
14

15 **Emergency Response**  
16

17 For emergency response to incidents on-base, the Air Force will provide emergency responders i.e.,  
18 firefighters; medical; Crashed, Damaged, or Disabled Aircraft Recovery (CDDAR) personnel trained on the  
19 Contractor's aircraft. The Contractor will ensure the host base's CDDAR personnel receive familiarization  
20 training on their aircraft and procedures prior to commencing local flying operations. The Contractor will  
21 provide technical expertise, personnel, and aircraft-specific equipment for all CDDAR events involving their  
22 aircraft. The Contractor will integrate with the host base's response and recovery of their aircraft, consistent  
23 with the following considerations: (1) urgency to open the runway for operational use; (2) prevention of  
24 secondary damage to the aircraft; and (3) preservation of evidence for mishap or accident investigations  
25 IAW AFI 91-202, *The US Air Force Mishap Prevention Program*, and AFI 91-204, National Transportation  
26 Safety Board (NTSB) guidelines, and any local base guidance.  
27

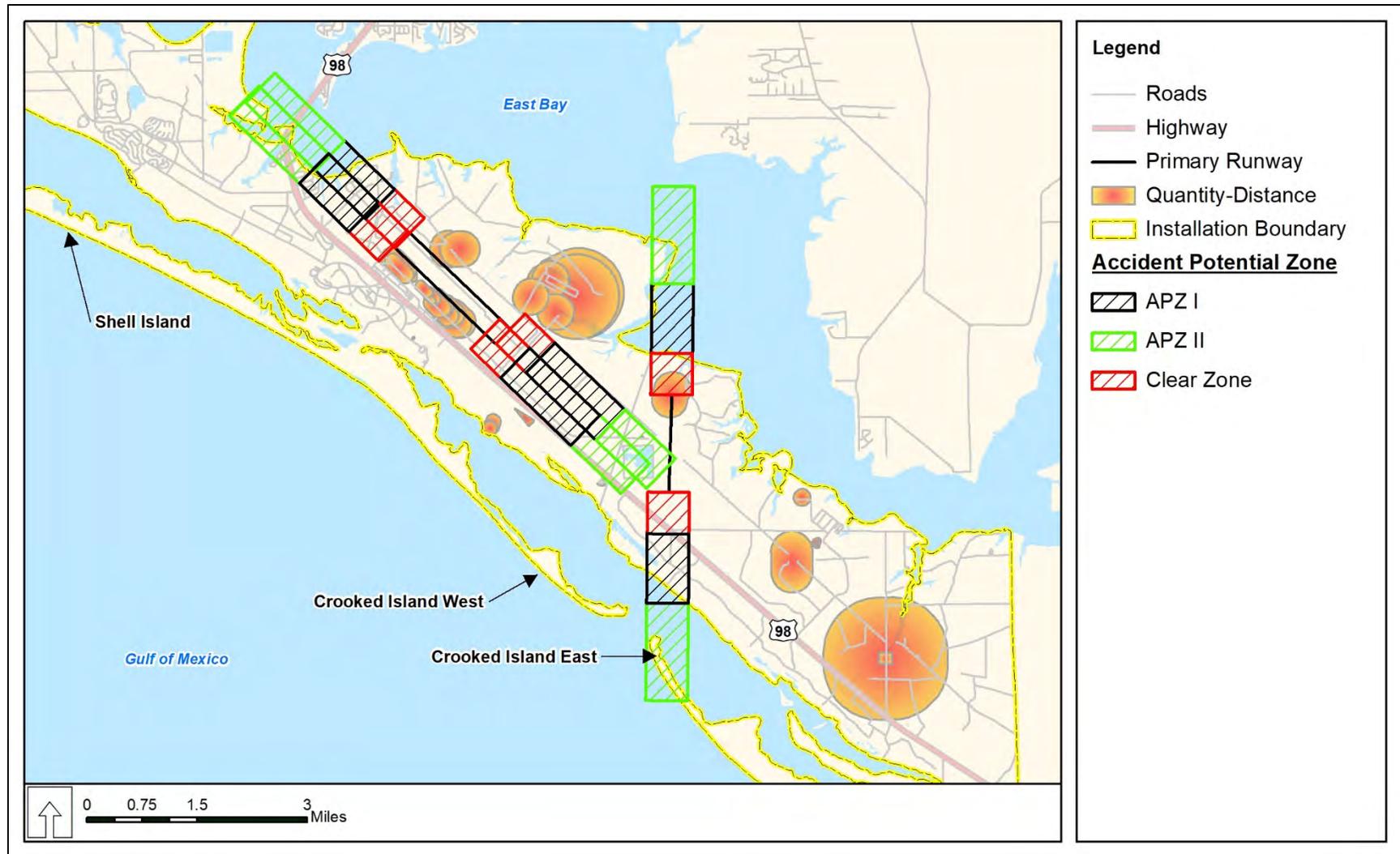
28 For an event occurring off-base, civilian authorities (city, county, or state) will be first responders to the  
29 incident and provide all incident response functions. The Air Force will respond to the scene and provide  
30 an Incident Commander and command staff for site management, security, and safety investigation  
31 purposes when Air Force assets are involved i.e., an Air Force pod was onboard the Contractor aircraft.  
32 For incidents not involving Air Force assets, The Air Force will respond to incidents to collaborate and  
33 coordinate with civilian and Federal authorities in accordance with established guidelines and agreements.  
34

35 **Safety Zones**  
36

37 Safety zones around airfields that restrict incompatible land uses are designated to reduce exposure to  
38 aircraft safety hazards. These include the CZs, which are areas immediately beyond the ends of a runway,  
39 and APZ I and APZ II, which are areas beyond the CZ. The standards for CZs and APZs are established  
40 by DOD Instruction 4165.57, *Air Installations Compatible Use Zones*. Within the CZ, which covers a  
41 3,000-by-3,000-ft area at the end of each runway, the overall accident risk is the highest. APZ I, which  
42 extends for 5,000 ft beyond the CZ, is an area of reduced accident potential. In APZ II, which is 7,000 ft  
43 long, accident potential is the lowest among the three zones.  
44

45 Open space (undeveloped) and agricultural uses (excluding raising of livestock) are the only uses deemed  
46 compatible in a CZ. Land use within APZs is based on the concept of limiting density of land use, and uses  
47 such as residential development, educational facilities, and medical facilities are considered incompatible  
48 and are strongly discouraged. There are no incompatible land uses within Tyndall CZs or APZs (Tyndall  
49 AFB, 2015a). The safety zones are shown on **Figure 3-7**.  
50

51 Quantity-distance (Q-D) arcs are an additional safety zone, described in **Section 3.3.2.2** and shown on  
52 **Figure 3-7**.



1  
2

Figure 3-7. Tyndall Air Force Base Clear Zones, Accident Potential Zones, and Quantity-Distance Arcs.

1 **Arresting Gear Capability**  
2

3 Per AFI 32-1043, *Managing Aircraft Arresting Systems*, criteria for siting aircraft arresting systems vary  
4 according to the type of system and operational requirement. The best location for arresting systems used  
5 extensively during instrument meteorological conditions is 2,200 to 2,500 ft from the threshold; however, if  
6 aircraft that are not compatible with the arresting system must operate on the same runway, the installation  
7 commander may shift the installation site as close to the threshold as possible. The critical factor in this  
8 case is assurance that the runout area for an aircraft engaging the system in an aborted takeoff scenario is  
9 large enough to safely accommodate other arresting systems or equipment such as light fixtures. Tyndall  
10 AFB is equipped with BAK-12 arresting systems at the approach and departure ends of runways 14L/32R  
11 and 14R/32L, BAK-15 arresting systems in the overruns of runways 14L/32R and MB-60 systems near  
12 each threshold.  
13

14 **3.4.2.2 Explosive Safety**  
15

16 The 325 FW's Munitions Flight is assigned to the 325 MXS located at Tyndall AFB. Personnel assigned to  
17 the 325 MXS Munitions Flight currently support the 325 FW flying mission with munitions support, including  
18 storage, inspection, maintenance, and accountability as well as delivery and pick-up of aircraft munitions  
19 to the airfield.  
20

21 Aircraft munitions include ammunition, propellants (solid and liquid), pyrotechnics, warheads, explosive  
22 devices, and chemical agent substances and associated components that present real or potential hazards  
23 to life, property, or the environment. AFMAN 91-201, *Explosives Safety Standards*, defines the guidance  
24 and procedures dealing with munition storage and handling.  
25

26 During typical training operations, aircraft are not loaded with high-explosive ordnance. Training munitions  
27 usually include captive air-to-air training missiles, countermeasure chaff and flares, and cannon ammunition  
28 with inert projectiles. All munitions are stored and maintained in the munitions storage area within facilities  
29 sited for the allowable types and amounts of explosives. All storage and handling of munitions is carried  
30 out by trained and qualified munitions systems personnel and in accordance with Air Force-approved  
31 technical orders.  
32

33 Defined distances are maintained between munitions storage areas and a variety of other types of facilities.  
34 These distances, called Q-D arcs, are determined by the type and quantity of explosive material to be  
35 stored. Each explosive material storage or handling facility has Q-D arcs extending outward from its sides  
36 and corners for a prescribed distance. Within these Q-D arcs, development is either restricted or prohibited  
37 altogether to ensure personnel safety and to minimize potential for damage to other facilities in the event  
38 of an accident. In accordance with AFMAN 91-201, paragraphs 12.47.2 and 12.47.3, the ramp does not  
39 need to be sited for chaff and flare and is not currently sited for Hazard Class 1.3. The Q-D arcs on Tyndall  
40 AFB are shown on **Figure 3-7**.  
41

42 **3.4.2.3 Flight Safety**  
43

44 Tyndall AFB control tower is located center-field and west of Tyndall AFB's two runways. The  
45 325th Operations Support Squadron operates the tower and supports the training and readiness of Air  
46 Force, Air National Guard, and Air Force Reserve F-22 pilots. The 325th Operations Support Squadron  
47 also controls air traffic, manages the airfield complex, and provides weather support. The control tower  
48 manages the aircraft flying within a range of approximately 5 mi of the base; when aircraft fly beyond this  
49 range, control is transferred to radar approach control.  
50

51 The potential for aircraft accidents is a primary public concern with regard to flight safety. Such accidents may  
52 occur as a result of midair collisions, collisions with manmade structures or terrain, mechanical failure,  
53 weather-related accidents, pilot error, BASH, or strikes from defensive countermeasures used during training.  
54  
55

1 **Midair Collision**

2  
3 Midair collision accidents involve two or more aircraft coming in contact with each other during flight.  
4 Navigation errors, miscommunications, deviations from flight plans, and lack of collision avoidance systems  
5 all increase the potential for midair collisions. Aircraft mishaps and their prevention represent a paramount  
6 concern for the Air Force. Air Force Policy Directive (AFPD) 91-2, *Safety Programs*, defines four major  
7 categories of reportable mishaps based on total cost of property damage or the degree of injury: Class A,  
8 B, C, and D mishaps. Mishap types range from loss of life or destruction of an aircraft (Class A) to a minor,  
9 reportable injury or property damage less than \$50,000 (Class D). Reporting and investigation requirements  
10 for aviation mishaps are defined in AFI 91-204, *Safety Investigation and Hazard Reporting*, and AFMAN  
11 91-223, *Safety: Aviation Safety Investigations and Reports*.

12  
13 **In-Flight Emergency**

14  
15 Each aircraft type has different emergency procedures based on the aircraft design which are produced by  
16 the original equipment manufacturer of the aircraft. Basic airmanship procedures also exist for handling any  
17 deviations to ATC procedures due to an in-flight emergency; these procedures are defined in AFI 11-202  
18 (Volume 3) and established aircraft flight manuals.

19  
20 **Bird/Wildlife-Aircraft Strike Hazards**

21  
22 BASH presents a safety concern for aircraft operations because of the potential for damage to aircraft or  
23 injury to aircrews or local populations if a crash should occur. Aircraft can encounter birds at nearly all  
24 altitudes up to 30,000 ft MSL; however, most birds fly close to the ground. According to the Air Force Safety  
25 Center (2018) BASH statistics, about 52 percent of strikes occur from birds flying below 400 ft and  
26 88 percent occur at less than 2,000 ft AGL.

27  
28 The Air Force BASH program was established to minimize the risk for collisions of birds/wildlife with aircraft  
29 and the subsequent loss of life and property. In accordance with AFI 91-202, each flying unit in the Air  
30 Force is required to develop a BASH plan to reduce hazardous bird/wildlife activity relative to airport flight  
31 operations. The intent of each plan is to reduce BASH issues at the airfield by creating an integrated hazard  
32 abatement program through monitoring, avoidance, and actively controlling bird and animal population  
33 movements. The Tyndall AFB BASH program is facilitated by active dispersals and depredation as required  
34 by a US Department of Agriculture/Wildlife Services biologist augmented by Airfield Management and Flight  
35 Safety personnel as required. Application of harassment via pyrotechnics and bioacoustics is the primary  
36 deterrent. Tyndall AFB is not in a migratory flyway but does occasionally see weather patterns that cause  
37 transient hazards from several bird species. Primary residents on the airfield are meadowlarks (*Sturnella*  
38 *magna*), mourning doves (*Zenaida macroura*), cowbirds (*Molothrus* spp.)/starlings (*Sturnus vulgaris*), and  
39 various perching birds. A population of vultures (*Coragyps atratus*), osprey (*Pandion haliaetus*), bald eagles  
40 (*Haliaeetus leucocephalus*), and kestrels (*Falco sparverius*) can be observed at various times throughout  
41 the year (vultures and osprey are present year round). A Bird Hazard Working Group is active in the 325 FW  
42 and Civil Engineering applies continuous effort to maintain infields and CZs to make the environment the  
43 least attractive to birds and wildlife.

44  
45 **3.5 AIR QUALITY**

46  
47 **3.5.1 Definition of the Resource**

48  
49 Under the authority of the Clean Air Act (CAA) and subsequent regulations, the USEPA has divided the  
50 country into geographical regions known as Air Quality Control Regions (AQCRs) to evaluate compliance with  
51 the National Ambient Air Quality Standards (NAAQS). Tyndall AFB is located in Bay County which is located  
52 in the Mobile (Alabama)-Pensacola-Panama City (Florida)-Southern Mississippi Interstate AQCR (40 CFR  
53 § 81.68). This AQCR includes all the counties in the Florida panhandle west of Apalachicola, Florida, including  
54 Bay, Calhoun, Escambia, Gulf, Holmes, Jackson, Okaloosa, Santa Rosa, Walton, and Washington Counties.

1 It also includes the 3 southernmost counties of Alabama and 38 counties covering the southern half of  
2 Mississippi.

3  
4 For air quality, there are multiple ROIs, one in the immediate vicinity of Tyndall AFB, one in the immediate  
5 vicinity of Eglin AFB (includes Eglin E MOA), one that encompasses the airspace over the Gulf of Mexico (W-  
6 151 and W-470), one that encompasses the airspace for the Rose Hill MOA, and one for the Tyndall E MOA  
7 (Carrabelle ATCAA), Tyndall B MOA (Compass Lake ATCAA), and the Tyndall C/H MOA (Compass Lake  
8 ATCAA).. All MOAs except Rose Hill coincide with the Mobile (Alabama)-Pensacola-Panama City (Florida)-  
9 Southern Mississippi Interstate AQCR. The Rose Hill MOA coincides with Geneva, Covington and Coffee  
10 Counties in Southern Alabama which are part of the Southeast Alabama Intrastate AQCR (40 CFR § 81.267).  
11 With respect to the Warning Areas, nearly all of W-151 and W-470 are located beyond the State Seaward  
12 boundary (9 NM for the Florida Gulf Coast) and the US territorial sea limit (12 NM from the coast). Thus, as  
13 the Warning Areas start 3 NM from the coast and extends out approximately 100 NM, only a very small portion  
14 of the Warning Areas would fall under state jurisdiction with respect to NAAQS compliance.

15  
16 For consideration of potential air quality impacts, it is the volume of air extending up to the mixing height  
17 (3,000 ft AGL) and coinciding with the spatial distribution of the ROIs that is considered. Pollutants that are  
18 released above the mixing height typically will not disperse downward and this will have little or no effect on  
19 ground level concentrations of pollutants. The mixing height represents the altitude at which the lower  
20 atmosphere will undergo mechanical or turbulent mixing, producing a nearly uniform air mass. The height of  
21 the mixing level determines the volume of air within which pollutants can disperse. Mixing heights at any one  
22 location or region can vary by the season and time of day, but for air quality applications, an average mixing  
23 height of 3,000 ft AGL is an acceptable default value (40 CFR § 93.153[c][2]). A portion of the ADAIR training  
24 is expected to occur at or below 3,000 ft within all airspace except for the Rose Hill MOA and the Tyndall B  
25 MOA. Similarly, in the vicinity of the Tyndall airfield itself, it is the portions of the landing and takeoff (LTO) and  
26 touch and go (TGO) cycles that occur at or below 3,000 ft that are analyzed. Also considered in the air quality  
27 analysis are the ground support and construction activities (if applicable) that take place on or adjacent to the  
28 airfield. Because all ADAIR training will occur above 3,000 ft in the Rose Hill MOA and Tyndall B MOA, they  
29 are not addressed further in the air quality assessment.

### 30 31 3.5.1.1 Criteria Pollutants

32  
33 In accordance with CAA requirements, the air quality in a given region or area is measured by the  
34 concentration of various pollutants in the atmosphere. Measurements of these “criteria pollutants” in  
35 ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter  
36 ( $\mu\text{g}/\text{m}^3$ ). Regional air quality is a result of the types and quantities of atmospheric pollutants and pollutant  
37 sources in an area as well as surface topography, the size of the “air basin,” and prevailing meteorological  
38 conditions.

39  
40 The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that  
41 would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA  
42 developed numerical concentration-based standards, NAAQS, for pollutants that have been determined to  
43 impact human health and the environment and established both primary and secondary NAAQS under the  
44 provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone ( $\text{O}_3$ ), carbon  
45 monoxide (CO), nitrogen dioxide ( $\text{NO}_2$ ), sulfur dioxide ( $\text{SO}_2$ ), respirable particulate matter (including  
46 particulates equal to or less than 10 microns in diameter ( $\text{PM}_{10}$ ) and particulates equal to or less than  
47 2.5 microns in diameter ( $\text{PM}_{2.5}$ ), and lead (Pb). The primary NAAQS represent maximum levels of  
48 background air pollution that are considered safe, with an adequate margin of safety to protect public health.  
49 Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops,  
50 and other public resources in addition to maintaining visibility standards. The primary and secondary  
51 NAAQS are presented in **Table 3-16**.

52  
53 The criteria pollutant  $\text{O}_3$  is not usually emitted directly into the air but is formed in the atmosphere by  
54 photochemical reactions involving sunlight and previously emitted pollutants, or “ $\text{O}_3$  precursors.” These  $\text{O}_3$   
55 precursors consist primarily of nitrogen oxides ( $\text{NO}_x$ ) and volatile organic compounds (VOCs) that are  
56 directly emitted from a wide range of emissions sources. For this reason, regulatory agencies limit

1 atmospheric O<sub>3</sub> concentrations by controlling VOC pollutants (also identified as reactive organic gases) and  
 2 NO<sub>x</sub>.  
 3

**Table 3-16. National Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Standard Value<sup>6</sup></b>		<b>Standard Type</b>
<b>Carbon Monoxide (CO)</b>			
8-hour average	9 ppm	(10 mg/m <sup>3</sup> )	Primary
1-hour average	35 ppm	(40 mg/m <sup>3</sup> )	Primary
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>			
Annual arithmetic mean	0.053 ppm	(100 µg/m <sup>3</sup> )	Primary and Secondary
1-hour average <sup>1</sup>	0.100 ppm	(188 µg/m <sup>3</sup> )	Primary
<b>Ozone (O<sub>3</sub>)</b>			
8-hour average <sup>2</sup>	0.070 ppm	(137 µg/m <sup>3</sup> )	Primary and Secondary
<b>Lead (Pb)</b>			
3-month average <sup>3</sup>		0.15 µg/m <sup>3</sup>	Primary and Secondary
<b>Particulate &lt;10 Micrometers (PM<sub>10</sub>)</b>			
24-hour average <sup>4</sup>		150 µg/m <sup>3</sup>	Primary and Secondary
<b>Particulate &lt;2.5 Micrometers (PM<sub>2.5</sub>)</b>			
Annual arithmetic mean <sup>4</sup>		12 µg/m <sup>3</sup>	Primary
Annual arithmetic mean <sup>4</sup>		15 µg/m <sup>3</sup>	Secondary
24-hour average <sup>4</sup>		35 µg/m <sup>3</sup>	Primary and Secondary
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>			
1-hour average <sup>5</sup>	0.075 ppm	(196 µg/m <sup>3</sup> )	Primary
3-hour average <sup>5</sup>	0.5 ppm	(1,300 µg/m <sup>3</sup> )	Secondary

Notes:

- <sup>1</sup> In February 2010, the USEPA established a new 1-hour standard for NO<sub>2</sub> at a level of 0.100 ppm, based on the 3-year average of the 98th percentile of the yearly distribution concentration, to supplement the then-existing annual standard.
- <sup>2</sup> In October 2015, the USEPA revised the level of the 8-hour standard to 0.070 ppm, based on the annual 4th highest daily maximum concentration, averaged over 3 years; the regulation became effective on 28 December 2015. The previous (2008) standard of 0.075 ppm remains in effect for some areas. A 1-hour standard no longer exists.
- <sup>3</sup> In November 2008, USEPA revised the primary lead standard to 0.15 µg/m<sup>3</sup>. USEPA revised the averaging time to a rolling 3-month average.
- <sup>4</sup> In October 2006, USEPA revised the level of the 24-hour PM<sub>2.5</sub> standard to 35 µg/m<sup>3</sup> and retained the level of the annual PM<sub>2.5</sub> standard at 15 µg/m<sup>3</sup>. In 2012, USEPA split standards for primary and secondary annual PM<sub>2.5</sub>. All are averaged over 3 years, with the 24-hour average determined at the 98th percentile for the 24-hour standard. USEPA retained the 24-hour primary standard and revoked the annual primary standard for PM<sub>10</sub>.
- <sup>5</sup> In 2012, the USEPA retained a secondary 3-hour standard, which is not to be exceeded more than once per year. In June 2010, USEPA established a new 1-hour SO<sub>2</sub> standard at a level of 75 ppb, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.
- <sup>6</sup> Parenthetical value is an approximately equivalent concentration for NO<sub>2</sub>, O<sub>3</sub>, and SO<sub>2</sub>.

µg/m<sup>3</sup> = microgram(s) per cubic meter; mg/m<sup>3</sup> = milligram(s) per cubic meter; ppb = part(s) per billion; ppm = part(s) per million; USEPA = United States Environmental Protection Agency

4 The USEPA has recognized that particulate matter emissions can have different health affects depending  
 5 on particle size and, therefore, developed separate NAAQS for coarse particulate matter (PM<sub>10</sub>) and fine  
 6 particulate matter (PM<sub>2.5</sub>). The pollutant PM<sub>2.5</sub> can be emitted from emission sources directly as very fine  
 7 dust and/or liquid mist or formed secondarily in the atmosphere as condensable particulate matter, typically  
 8 forming nitrate and sulfate compounds. Secondary (indirect) emissions vary by region depending upon the  
 9 predominant emission sources located there and thus which precursors are considered significant for PM<sub>2.5</sub>  
 10 formation and identified for ultimate control.

11  
 12 The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local  
 13 agencies. As such, each state must develop air pollutant control programs and promulgate regulations and  
 14 rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. When a region or  
 15 area fails to meet a NAAQS for a pollutant, that region is classified as “nonattainment” for that pollutant. In  
 16 such cases the affected State must develop a State Implementation Plan (SIP) that is subject to USEPA  
 17 review and approval. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions

1 designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or  
2 plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved  
3 by USEPA.

4  
5 The CAA required that USEPA draft general conformity regulations that are applicable in nonattainment  
6 areas, or in designated maintenance areas (attainment areas that were reclassified from a previous  
7 nonattainment status and are required to prepare a maintenance plan for air quality). These regulations are  
8 designed to ensure that federal actions do not impede local efforts to achieve or maintain attainment with  
9 the NAAQS. The General Conformity Rule and the promulgated regulations found in 40 CFR Part 93  
10 exempt certain federal actions from conformity determinations (e.g., contaminated site cleanup and natural  
11 disaster response activities). Other federal actions are assumed to conform if total indirect and direct project  
12 emissions are below *de minimis* levels presented in 40 CFR § 93.153. The threshold levels (in tons of  
13 pollutant per year) depend upon the nonattainment status that USEPA has assigned to a region. Once the  
14 net change in nonattainment pollutants is calculated, the federal agency must compare them to the *de*  
15 *minimis* thresholds.

16  
17 Title V of the CAA Amendments of 1990 requires state and local agencies to implement permitting programs  
18 for major stationary sources. A major stationary source is a facility (plant, base, activity, etc.) that has the  
19 potential to emit more than 100 tons per year (tpy) of any one criteria air pollutant in an attainment area.

20  
21 Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from  
22 proposed major stationary sources or modifications to be “significant” if a project’s net emission increase  
23 meets or exceeds the rate of emissions listed in 40 CFR § 52.21(b)(23)(i); or 1) a proposed project is within  
24 10 kilometers of any Class I area (wilderness area greater than 5,000 ac or national park greater than  
25 6,000 ac).

26  
27 Although Titles I and V of the CAA Amendments of 1990 apply to Tyndall AFB, compliance requirements  
28 under the relevant regulations would not apply. This is because virtually all of the emissions increase from  
29 the Proposed Action would occur from mobile sources, which are not governed by Titles I and V. As such,  
30 the requirements originating from these titles are not considered further.

31  
32 The FDEP Division of Air Resource Management implements the federal CAA and related Florida statutes  
33 that are codified in Chapter 62 of the Florida Administrative Code. With respect to ambient air quality  
34 standards Florida Administrative Code 62-204.800 adopts the National Primary and Secondary Ambient  
35 Air Quality Standards (40 CFR Part 50) by reference, thereby requiring the use of the standards within the  
36 State of Florida. Florida’s statewide air quality monitoring network is operated by both state and local  
37 environmental programs. The air is monitored for CO, Pb, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and SO<sub>2</sub>. Not all pollutants  
38 are monitored in all areas. Florida has over 210 air quality monitors at 97 sites strategically positioned  
39 across the state (FDEP, 2018).

### 40 41 3.5.1.2 Greenhouse Gases

42  
43 Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by  
44 both natural processes and human activities. The accumulation of GHGs in the atmosphere helps regulate  
45 the earth’s temperature and are believed to contribute to global climate change. GHGs include water vapor,  
46 carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide, O<sub>3</sub>, and several hydrocarbons and chlorofluorocarbons. Each  
47 GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and  
48 its ability to absorb and radiate infrared energy emitted from the earth’s surface. The GWP of a particular  
49 gas provides a relative basis for calculating its CO<sub>2</sub> equivalent (CO<sub>2</sub>e) or the amount of CO<sub>2</sub>e to the  
50 emissions of that gas. CO<sub>2</sub> has a GWP of 1 and is, therefore, the standard by which all other GHGs are  
51 measured. Potential impacts associated with GHG emissions are discussed in **Section 4.4**.

52  
53 In Florida, the USEPA regulates GHG primarily through a permitting program known as the GHG Tailoring  
54 Rule. This rule applies to GHG emissions from stationary sources. As there is an emissions decrease from  
55 the per-hurricane baseline and the emissions from the Proposed Action would occur from mobile sources,

1 this rule does not apply here. As such, this rule is not considered further. Again, this only applies to  
2 stationary sources of emissions.

3  
4 In addition to the GHG Tailoring Rule in 2009, the USEPA promulgated a rule requiring sources to report  
5 their GHG emissions if they emit more than 25,000 metric tons or more of CO<sub>2</sub>e per year (40 CFR  
6 § 98.2[a][2]).

### 7 8 3.5.2 Existing Conditions – Tyndall Air Force Base and Airspace

#### 9 10 3.5.2.1 Regional Climate

11  
12 The regional climate of the Florida panhandle is classified as humid subtropical which is characterized by  
13 mild winters and hot, humid summers. The region is heavily influenced by semipermanent subtropical  
14 cyclone, referred to as the Bermuda High located to the east and southeast of Florida. The circulation  
15 around this feature results in a moist, maritime air flow across the Gulf of Mexico and the southeast United  
16 States (Weatherbase, 2019). The warmest months are July and August, with average high and low  
17 temperatures of 90 degrees Fahrenheit (°F) and 75°F, respectively. January is the coldest month with an  
18 average high temperature of 63°F and average low temperature of 42°F. The wettest month is July with an  
19 average of 7.4 in. of rain, and the driest month is January with an average of 3.1 in. of precipitation (US  
20 Climate Data, 2019). Overall, June through September are the wettest months due to frequent  
21 thunderstorms and occasional tropical waves/cyclones (Weatherbase, 2019). Although the winters are mild,  
22 the region is occasionally affected by polar fronts that can usher in cold, continental air masses that result  
23 in dry and cold conditions that sometimes result in frost. Winter precipitation is most often a result of frontal  
24 cyclones that form along the polar front (Weatherbase, 2019). Because of the proximity of the special use  
25 airspace to Tyndall AFB, it falls within the same regional climate regime as Tyndall AFB.

#### 26 27 3.5.2.2 Baseline Air Emissions

28  
29 Tyndall AFB and the nearby MOAs (Eglin E, Tyndall E, B, and C/H) are located in an attainment area for  
30 all criteria pollutants (USEPA, 2019c). In addition, the counties bordering W-151 and W-470 are also in  
31 attainment for all criteria pollutants. All the counties within and bordering the special use airspace are part  
32 of the Mobile (Alabama)-Pensacola-Panama City (Florida)-Southern Mississippi Interstate AQCR. Because  
33 of the attainment status, Tyndall AFB and the airspace proposed for ADAIR training would not be subject to  
34 the General Conformity Rule; however, to evaluate potential air quality impacts, emissions were compared  
35 against the General Conformity Rule *de minimis* thresholds as a significance indicator and regional/county  
36 baseline emissions in the ROIs. Note in this case using the General Conformity Rule *de minimis* thresholds  
37 as a significance indicator does not trigger a regulatory requirement if exceeded. It provides a sign that an  
38 action could be approaching a threshold which would trigger regulatory requirements.

39  
40 Tyndall AFB has taken emission limits through the States Operating Permit Program, and thus, the facility  
41 is classified as a synthetic minor source. For stationary sources, Tyndall's State Operating Permit limits  
42 CO, SO<sub>2</sub>, and NO<sub>x</sub> emissions to 90 tpy and VOC emissions to 80 tpy (FDEP, 2015). Tyndall AFB is not  
43 classified as a major source for PSD, and its airspace is not located within 10 kilometers of any of the  
44 156 USEPA-designated Class I areas protected by the Regional Haze Rule. As shown in **Table 3-17**,  
45 Tyndall AFB accounts for less than 3.0 percent of NO<sub>x</sub> emissions in Bay County and less than 1.5 percent  
46 for all other criteria pollutants.

47  
48 **Table 3-18** summarizes baseline GHG emissions for the State of Florida. The State emissions shown  
49 represent CO<sub>2</sub> from fossil fuel combustion only. Overall fossil fuel combustion is the largest source of GHG  
50 emission in the United States, accounting for approximately 76 percent of all GHG emissions emitted  
51 (USEPA, 2018b). This is also the case on the state level. Other sectors (i.e., industrial processes;  
52 agriculture; waste; and land use, land-use change, and forestry) can also be significant on a state level but  
53 are not included in the state total shown in **Table 3-18** because of the lack of reliable data (USEPA, 2018b).

**Table 3-17. Tyndall Air Force Base Criteria Pollutant Emission Summary (Tons per Year)**

	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC
Stationary Emissions <sup>1</sup>	7.18	11.5	1.15	1.03	0.671	13.1
Mobile Emissions <sup>2,3</sup>	200	256	42.6	37.8	20.7	36.1
Total Tyndall AFB	207	268	43.8	38.8	21.4	49.2
Bay County <sup>4</sup>	51,670	9,220	10,125	3,526	8,360	36,318
Tyndall AFB Percent of County Emissions	0.40	2.90	0.43	1.10	0.26	0.14

Notes:

<sup>1</sup> Air Force, 2016a

<sup>2</sup> Air Force, 2013

<sup>3</sup> Mobile Source Inventory includes aerospace ground equipment, aircraft operations, nonroad engine, and vehicle emissions.

<sup>4</sup> USEPA, 2019a

AFB = Air Force Base; CO = carbon monoxide; NO<sub>x</sub> = nitrogen oxide; PM<sub>2.5</sub> = particulate matter with a diameter of less than 2.5 micrometers; PM<sub>10</sub> = particulate matter with a diameter of less than 10 micrometers; SO<sub>2</sub> = sulfur dioxide; USEPA = United States Environmental Protection Agency; VOC = volatile organic compound

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**Table 3-18. Baseline Greenhouse Gas Emission**

Location/Description	Carbon Dioxide (metric tons per year)
Tyndall AFB Emissions <sup>1</sup>	4,225
Florida Emissions <sup>2,3</sup>	230.1*E6
Tyndall AFB Percentage of State GHG Emissions	0.002

Notes:

<sup>1</sup> Air Force, 2016b

<sup>2</sup> USEPA, 2018b

<sup>3</sup> Represents 2016 fossil fuel emissions of carbon dioxide for commercial, industrial, residential, transportation, and energy sectors.

AFB = Air Force Base; GHG = greenhouse gas; USEPA = United States Environmental Protection Agency

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There are 15 categories of stationary emissions sources listed in the Tyndall AFB air inventory (Air Force, 2016a). Jet engine testing is the largest source of NO<sub>x</sub>, CO, PM, and SO<sub>x</sub> emissions. Surface coating is the largest source of VOC emissions. For mobile sources, NO<sub>x</sub> had the largest emission rate (256 tpy). Aircraft operations accounted for over 40 percent of the NO<sub>x</sub> emissions.

The Eglin E MOA spans Okaloosa, Walton, and Santa Rosa Counties and are part of the same AQCR as Eglin AFB. **Table 3-19** shows provides the total emissions for the area based upon the National Emissions Inventory (USEPA, 2019a).

1 **Table 3-19. Military Operations Area Counties and Associated Baseline Emissions (Tons per Year)**

Pollutant <sup>1</sup>	Okaloosa, Walton, Santa Rosa (Eglin E MOA) <sup>2</sup>
CO	183,080
NO <sub>2</sub>	16,400
PM <sub>10</sub>	42,616
PM <sub>2.5</sub>	13,561
SO <sub>2</sub>	2,608
VOC	140,667

Notes:

<sup>1</sup> USEPA, 2018b

<sup>2</sup> Includes emissions from highway and off-highway vehicles

CO = carbon monoxide; MOA = Military Operations Area; NO<sub>2</sub> = nitrogen dioxide; PM<sub>2.5</sub> = particulate matter with a diameter of less than 2.5 micrometers; PM<sub>10</sub> = particulate matter with a diameter of less than 10 micrometers; SO<sub>2</sub> = sulfur dioxide; USEPA = United States Environmental Protection Agency; VOC = volatile organic compound

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The Tyndall MOAs are within several counties that are all part of the same AQCR. **Table 3-20** shows the counties that each MOA falls within and provides the total emissions for these areas based upon the National Emissions Inventory (USEPA, 2019a).

**Table 3-20. Counties and Associated Baseline Emissions (Tons per Year) by Military Operations Area**

Pollutant	Bay, Washington (Tyndall B MOA)	Bay, Liberty, Calhoun, Jackson (Tyndall C/H MOA)	Franklin, Gulf, Liberty, Wakulla (Tyndall E MOA)
CO	64,608	121,182	127,564
NO <sub>2</sub>	11,100	14,253	5,780
PM <sub>10</sub>	16,908	33,819	25,267
PM <sub>2.5</sub>	4,742	10,552	11,059
SO <sub>2</sub>	8,426	9,679	1,144
VOC	60,815	132,586	135,911

Notes:

<sup>3</sup> USEPA, 2018b

CO = carbon monoxide; MOA = Military Operations Area; NO<sub>2</sub> = nitrogen dioxide; PM<sub>2.5</sub> = particulate matter with a diameter of less than 2.5 micrometers; PM<sub>10</sub> = particulate matter with a diameter of less than 10 micrometers; SO<sub>2</sub> = sulfur dioxide; USEPA = United States Environmental Protection Agency; VOC = volatile organic compound

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### 3.6 BIOLOGICAL RESOURCES

#### 3.6.1 Existing Conditions – Airspace

The information presented in this section was gathered from the Eglin AFB INRMP (Eglin AFB, 2017a), the Tyndall AFB INRMP (Tyndall AFB, 2015b), and the *Final Atlantic Fleet Testing and Training Environmental Impact Statement/Overseas Environmental Impact Statement* (US Navy, 2018). Data were also gathered from the USFWS, NMFS, and FWC.

1 3.6.1.1 Regional Biological Setting

2  
3 **Military Operations Areas**

4  
5 The Eglin E MOA is located almost entirely over the Eglin Reservation and the nearshore environment of  
6 the Gulf of Mexico; as such the vegetation and wildlife description provided for Eglin AFB is representative  
7 of the natural resources in the Eglin E MOA.

8  
9 The Rose Hill MOA is located entirely within the Southeastern Plains Level III Ecoregion. Ecoregions are  
10 used to describe areas of similar type, quality, and quantity of environmental resources (USEPA, 2018a).  
11 Ecoregions are assigned hierarchical levels to delineate ecosystems spatially based on different levels of  
12 planning and reporting needs. Level I is the broadest ecoregion level, dividing North America into  
13 15 ecological regions. Level II includes 50 ecoregions and Level III divides the continental United States  
14 into 105 ecoregions. Level IV further subdivides the Level III ecoregions (USEPA, 2018a).

15 To describe the ecosystems within the Rose Hill MOA, the Level III Ecoregion is used. Level III ecoregion  
16 descriptions provide a regional perspective and are more specifically oriented for environmental monitoring,  
17 assessment and reporting, and decision-making (Commission for Environmental Cooperation, 1997). The  
18 vegetation and wildlife common within the ecoregions are described below.

19  
20 The Tyndall MOAs are located within two Level III Ecoregions. To describe the ecosystems within the  
21 MOAs, Level III Ecoregions are used. The Southeastern Plains and Southern Coastal Plain are the two  
22 Level III ecoregions associated with the Tyndall MOAs.

23  
24 **Southeastern Plains Ecoregion.** The Southeastern Plains Ecoregion consists of a mosaic of cropland,  
25 pasture, woodland, and forest. Natural vegetation is mostly oak-hickory-pine and southern mixed forest.  
26 Streams and rivers in this region are typically low gradient drainages with sandy bottoms (USEPA, 2018a).  
27 Typical wildlife and fish species found in this ecoregion are similar to the terrestrial wildlife and freshwater  
28 fish species described for Eglin AFB.

29  
30 **Southern Coastal Plain Ecoregion.** The Southern Coastal Plain Ecoregion is comprised of mostly flat  
31 plains containing swamps, marshes and lakes. Historically, this ecoregion was dominated by forests of  
32 beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*)  
33 slash pine, loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), and laurel oak (*Quercus hemisphaerica*);  
34 however, most of the ecoregion now contains longleaf-slash pine forest, with oak-gum-cypress forest in low  
35 lying areas, and pasture and urban development (USEPA, 2018a). Typical wildlife and fish species found  
36 in this ecoregion are similar to those described for Tyndall AFB.

37  
38 **Southern Coastal Plain Ecoregion.** The Southern Coastal Plain Ecoregion is comprised of mostly flat  
39 plains containing swamps, marshes and lakes. Historically, this ecoregion was dominated by forests of  
40 beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*)  
41 slash pine, loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), and laurel oak (*Quercus hemisphaerica*);  
42 however, most of the ecoregion now contains longleaf-slash pine forest, with oak-gum-cypress forest in low  
43 lying areas, and pasture and urban development (USEPA, 2018a). Typical wildlife and fish species found  
44 in this ecoregion are similar to those described for Tyndall AFB.

45  
46 **Warning Areas W-151 and W-470**

47  
48 The Warning Areas include offshore waters off the coast of Florida. The inshore and offshore boundaries  
49 of the Warning Areas are roughly parallel to the shoreline contour. The shoreward boundary is 3 NM from  
50 shore, and the seaward boundary is approximately 85 to 100 NM offshore. Water depths range from  
51 approximately 65 to 2,300 ft. Approximately half of the Warning Areas overlie the continental shelf and half  
52 overlie the continental slope (Air Force, 2018c).

53  
54 **Plankton.** Plankton are organisms that move with the ocean's currents and cannot maintain independent  
55 movement against water currents. Plankton include phytoplankton, which are plant-like organisms including  
56 algae, zooplankton, which are animals including fish eggs and larvae, and bacterioplankton, which are

1 comprised of bacteria. Phytoplankton are critical to marine food webs. Phytoplankton are most commonly  
2 found in surface waters and in nearshore environments where nutrients and sunlight are more plentiful.  
3 Phytoplankton concentrations generally decrease with the distance from shore and become less prevalent  
4 in the deeper waters of the continental slope.

5  
6 The eggs and larvae of fish, which comprise a large portion of zooplankton in the marine environment, are  
7 typically found in the upper 650 ft of the ocean water column. As fish larvae mature, their motility increases,  
8 and they feed on phytoplankton and smaller zooplankton. The combination of phytoplankton and the smaller  
9 zooplankton concentrations are critical to supporting fisheries health and abundance (US Navy, 2018).

10  
11 **Benthic Organisms.** Benthic organisms are bottom-dwelling animals that live on and within the marine  
12 sediments. These include crustaceans, echinoderms, anthozoans, annelids, mollusks, and ground fish.  
13 Some benthic organisms burrow into soft bottoms while other attach themselves to hard structure located  
14 on the ocean floor. Most of the Warning Areas are comprised of soft bottoms and the benthic organisms  
15 present in these areas include polychaete and archiannelid worms, bivalves, amphipods, and asteroids  
16 (US Navy, 2018).

17  
18 Hard and intermediate bottom structure is present in the Warning Areas off the coast of Florida. This  
19 structure includes rock outcrops, hard structure from fossil remains, artificial reefs, and shipwrecks that  
20 could support benthic invertebrates, such as bryozoans, hard and soft corals, hydroids, anemones,  
21 encrusting algae, and sponges. These hard structure areas also support foraging sea turtles and  
22 commercial/recreational fishes (US Navy, 2018).

23  
24 **Fish.** Fish species vary greatly with depth of water, salinity, distance from shore, clarity of the water,  
25 availability of structure, and availability of prey. The upper 650 ft of the ocean is the epipelagic zone where  
26 there is sufficient sunlight penetration to support phytoplankton while the portion of the ocean's water  
27 column between 650 and 3,200 ft is the mesopelagic zone where light penetration is minimal. Sunlight does  
28 not penetrate below the mesopelagic zone (Moyle and Cech, 2004). Most fish in the ocean occur in the  
29 epipelagic zone and those associated with the nearshore environment are the most commercially valuable.  
30 Fish species of greatest interest in the nearshore environment include gobies (Gobiidae), drums  
31 (Sciaenidae), seabasses (Serranidae), groupers (Epinephelidae), snappers (Lutjanidae), and sculpins  
32 (Cottidae) associated with hard bottom habitat and white flounder (Bothidae and Paralichthyidae) and  
33 stingrays (Dasyatidae) associated with soft bottom habitat. Tunas (Scombridae), salmon (Salmonidae),  
34 billfishes and swordfishes (Xiphiidae), sharks (Carcharhinidae), sauries (Scomberesocidae), and ocean  
35 sunfish (Molidae) are oceanic epipelagic fish that could occur in the Warning Areas (US Navy, 2018).

36  
37 **Marine Mammals.** There are 22 cetacean species that could occur within the Warning Areas (**Table 3-21**).  
38 Some cetacean species are resident year round while others occur seasonally as they migrate through the  
39 area.

40  
41 **Table 3-21. Marine Mammals with the Potential to Occur in Warning Areas**

Common Name	Scientific Name	Endangered Species Act Listing	Occurrence in the Warning Areas <sup>1</sup>
<b>Cetaceans</b>			
Bryde's whale	<i>Balaenoptera brydei</i>	Endangered	Occurs year-round.
Sperm whale	<i>Physeter macrocephalus</i>	Endangered	Occurs year-round in deep waters.
Pygmy sperm whale	<i>Kogia breviceps</i>	-	Occurs year-round.
Dwarf sperm whale	<i>Kogia sima</i>	-	Occurs year-round.
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	-	Occurs over the continental slope year-round.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Endangered Species Act Listing</b>	<b>Occurrence in the Warning Areas<sup>1</sup></b>
Gervais' beaked whale	<i>Mesoplodon europaeus</i>	-	Occurs over the continental slope year-round.
Blainville's beaked whale	<i>Mesoplodon densirostris</i>	-	Occurs over the continental slope year-round.
Killer whale	<i>Orcinus orca</i>	-	Occurs year-round.
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	-	Occurs year-round.
Pygmy killer whale	<i>Feresa attenuata</i>	-	Occurs in waters over the continental slope year-round.
False killer whale	<i>Pseudorca crassidens</i>	-	Occurs in warm waters off of the continental shelf year-round.
Melon-headed whale	<i>Peponocephala electra</i>	-	Occurs in deep warm waters over the continental shelf year-round.
Rough-toothed dolphin	<i>Steno bredanensis</i>	-	Occurs in waters over the continental slope year-round.
Bottlenose dolphin	<i>Tursiops truncatus</i>	-	Occurs in waters over the continental shelf year-round.
Risso's dolphin	<i>Grampus griseus</i>	-	Occurs along the continental shelf break year-round.
Pantropical spotted dolphin	<i>Stenella attenuata</i>	-	Occurs in waters over the continental slope year-round.
Atlantic spotted dolphin	<i>Stenella frontalis</i>	-	Year-round occurrences.
Spinner dolphin	<i>Stenella longirostris</i>	-	Occurs in deep warm waters year-round.
Clymene dolphin	<i>Stenella clymene</i>	-	Occurs year-round in the deep warmer waters.
Striped dolphin	<i>Stenella coeruleoalba</i>	-	Occurs in waters over the continental slope from the continental break eastward year-round.
Fraser's dolphin	<i>Lagenodelphis hosei</i>	-	Likely rare; however, there is the potential to occur year-round.
<b>Sirenia</b>			
West Indian manatee	<i>Trichechus manatus</i>	Threatened	Commonly occurs in nearshore waters

1 Notes:

2 <sup>1</sup> Sources: Würsig, 2017; US Navy, 2018

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**Threatened and Endangered Species and/or Species of Concern**

Federally endangered and threatened marine species protected under the ESA that could occur in the offshore environment in the Warning Areas are managed by NMFS (see **Table 3-21**). Because there are no proposed ocean surface or underwater activities in Warning Areas, and activities are limited to aircraft overflights in the airspace where noise and visual cues could cause behavioral changes in birds, mammals, and sea turtles, there would be no impacts on listed fish, such as the Gulf sturgeon or smalltooth sawfish, invertebrates, or crustaceans. Of the listed species in the Warning Areas, the RCW, piping plover, snowy plover, least tern, red knot, Southeastern American kestrel, Choctawhatchee beach mouse, St. Andrew beach mouse, West Indian manatee, Gulf sturgeon, and smalltooth sawfish can occur in the Tyndall MOAs and were previously described for Tyndall AFB.

1 A list of all federal and state listed species with the potential to occur in the Eglin and Tyndall MOAs is  
2 provided in **Appendix D**.

3  
4 Federal and state listed threatened and endangered species that could occur in the Rose Hill MOA are  
5 provided in **Appendix D**. The state of Alabama does not have a state law equivalent to the ESA that lists  
6 species as threatened or endangered; all of the state listed species in the Rose Hill MOA are Florida state  
7 listed species and have state status only for that portion of the Rose Hill MOA that extends into the state of  
8 Florida. The federally listed species that could occur in the Rose Hill MOA and potentially be affected by  
9 contract ADAIR sorties are the RCW, wood stork, gray bat (*Myotis grisescens*), and Gulf sturgeon.

### 10 **Invasive Species**

11  
12  
13 Overflight activities from contract ADAIR training in the Warning Areas and MOAs would have no impacts on  
14 invasive species. Invasive species in the Warning Areas and MOAs are therefore not described further.  
15

## 16 **3.7 CULTURAL RESOURCES**

17  
18 Hurricane Michael damaged or destroyed a large number of facilities on Tyndall AFB. As analyzed in the  
19 2020 EA for Hurricane Recovery and Installation Development, 264 facilities on base are scheduled for  
20 demolition. A comprehensive analysis of cultural resource impacts was conducted and is incorporated by  
21 reference.  
22

23 Prior to the hurricane, a total of 316 buildings and structures were evaluated for inclusion in the National  
24 Register of Historic Places (NRHP). These resources were built between 1942 and 1991. Of these, nine  
25 extant resources were determined to be eligible for inclusion in the NRHP. After the hurricane there is  
26 one extant resource determined to be eligible. That resource is Building 703, Chapel 1, constructed in  
27 1943. All other facilities have been designated and consulted on with SHPO as not eligible (Tyndall AFB,  
28 2019c).  
29

30 There are two historic districts on Tyndall AFB but none in the cantonment or flightline area (Tyndall AFB,  
31 2019c; National Park Service, 1996).  
32

33 After Hurricane Michael, consultation with the Florida State Historic Preservation Office and six  
34 recognized Native American Tribes promptly commenced, aided by the expedited review inherent in  
35 disaster relief regulations. To date more than 20 consultations have been successfully concluded, with  
36 undertakings addressing the construction of temporary facilities, demolition of facilities assessed as  
37 beyond safe repair, timber debris removal and salvage, equipment recovery of displaced items, and  
38 debris stockpile removal, to note just a few. Subsequent consultations have addressed major planning  
39 efforts to reduce installation vulnerabilities, such as replacing overhead utilities with underground  
40 systems.  
41

42 Tyndall AFB, supported by AFCEC, hosted a two-day consultation meeting in March 2019 with tribal  
43 representatives. The consultation meeting featured a base tour to observe the hurricane damage and  
44 recovery efforts. In addition, Tyndall AFB and the tribes agreed to work towards the creation of a  
45 programmatic agreement to facilitate continued consultation and relationship building in connection with  
46 recovery actions. Concerns expressed by tribal representatives included the disturbance of newly  
47 exposed cultural material and artifacts in areas not previously or sufficiently surveyed. To address these  
48 concerns, archaeological monitors are utilized onsite during certain actions and several cultural resources  
49 assessment surveys are in process to evaluate areas not previously assessed for historic eligibility  
50 (Tyndall AFB, 2019c).  
51

52 The Tyndall archaeological sites inventory includes 361 sites (Tyndall AFB, 2019c). Of these, 29 have  
53 been recommended eligible for inclusion in the NRHP, 173 have been determined potentially eligible (or  
54 are not evaluated), and 189 have been recommended as not eligible. Nearly two-thirds of the base's  
55 property has been surveyed (Tyndall AFB, 2019c). This area of Florida has a particularly rich history, and  
56 site types range from large and/or complex (e.g., burial mounds, villages with extensive shell middens) to

1 the smaller and more discrete (e.g., limited use resource extraction locations). Cultural classifications for  
2 these sites is not always conclusive; however, all of the eligible sites have Native American components  
3 spanning the Archaic to Mississippian, or roughly 9,500 years before present to AD 1500. The great  
4 majority of the potentially eligible sites represent the same range. There is also the potential for historic  
5 site types (e.g., farmsteads, cemeteries, abandoned settlements). Though this directly reflects resources  
6 associated with the base, it can also be extrapolated to address overland airspace.

7  
8 The National Oceanic and Atmospheric Administration (NOAA) maintains a Wrecks and Obstructions  
9 Database. Their Automated Wreck and Obstruction Information System contains information on over  
10 10,000 submerged wrecks and obstructions in the coastal waters of the United States (NOAA, n.d.).  
11 There are several hundred wrecks and obstructions under the airspace. It is important to note that the  
12 potential for submerged prehistoric sites is equally great. Since Florida has one of the longest continuous  
13 coastlines in the country, the range of underwater archaeological sites is broad and covers thousands of  
14 years. The State Underwater Archaeologist has conducted surveys and excavations on both prehistoric  
15 and historic sites located offshore - from submerged Native American middens (garbage dumps) and  
16 habitation sites to the remains of sunken steamboats and schooners (Florida Division of Historic  
17 Resources, 2019).

18  
19 No ground disturbance is currently anticipated to take place as part of the Proposed Action; therefore,  
20 potential archaeological deposits would not be impacted. Sorties within the special use airspace would be  
21 performed at an altitude that would not affect cultural resources.

## 22 23 3.8 HAZARDOUS MATERIALS AND WASTES, CONTAMINATED SITES, AND TOXIC SUBSTANCES

### 24 25 3.8.1 *Definition of the Resource*

26  
27 The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the  
28 Superfund Amendments and Reauthorization Act and the Toxic Substances Control Act (TSCA), defines  
29 hazardous materials (HAZMAT). HAZMAT is defined as any substance with physical properties of  
30 ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible  
31 illness, and incapacitating reversible illness, or that might pose a substantial threat to human health or the  
32 environment. The Occupational Safety and Health Administration (OSHA) is responsible for enforcement  
33 and implementation of federal laws and regulations pertaining to worker health and safety under 29 CFR  
34 Part 1910. OSHA also includes the regulation of HAZMAT in the workplace and ensures appropriate training  
35 in their handling.

36  
37 The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act, which was  
38 further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. Hazardous  
39 waste is defined as any solid, liquid, contained gaseous, or semi-solid waste, or any combination of wastes,  
40 that pose a substantial present or potential hazard to human health or the environment. In general, both  
41 HAZMAT and hazardous wastes include substances that, because of their quantity, concentration, physical,  
42 chemical, or infectious characteristics, might present substantial danger to public health and welfare or the  
43 environment when released or otherwise improperly managed.

44  
45 AFD 32-70 establishes the policy that the Air Force is committed to

- 46 • cleaning up environmental damage resulting from its past activities;
- 47 • meeting all environmental standards applicable to its present operations;
- 48 • planning its future activities to minimize environmental impacts;
- 49 • responsibly managing the irreplaceable natural and cultural resources it holds in public trust; and
- 50 • eliminating pollution from its activities wherever possible.

51  
52 AFI 32-7044, *Storage Tank Compliance*, implements AFD 32-70 and identifies compliance requirements  
53 for underground storage tanks (USTs), aboveground storage tanks (ASTs), and associated piping that store  
54 petroleum products and hazardous substances. Evaluation of HAZMAT and hazardous wastes focuses on  
55 USTs and ASTs as well as the storage, transport, and use of pesticides, fuels, oils, and lubricants.

1 Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes  
2 when such activity occurs at or near the project site of a Proposed Action. In addition to being a threat to  
3 humans, the improper release of HAZMAT and hazardous wastes can threaten the health and well-being  
4 of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of HAZMAT  
5 or hazardous wastes, the extent of contamination varies based on type of soil, topography, weather  
6 conditions, and water resources.

7  
8 AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, establishes procedures and  
9 standards that govern management of HAZMAT throughout the Air Force. It applies to all Air Force  
10 personnel who authorize, procure, issue, use, or dispose of HAZMAT, and to those who manage, monitor,  
11 or track any of those activities.

12 Through the Environmental Restoration Program (ERP) (formerly the Installation Restoration Program  
13 [IRP]) initiated in 1980, a subcomponent of the Defense ERP that became law under Superfund  
14 Amendments and Reauthorization Act, each DOD installation is required to identify, investigate, and clean  
15 up hazardous waste disposal or release sites. Remedial activities for ERP sites follow the Hazardous and  
16 Solid Waste Amendment of 1984 under the Resource Conservation and Recovery Act Corrective Action  
17 Program and Comprehensive Environmental Response, Compensation, and Liability Act. The ERP  
18 provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of  
19 contaminants, minimize potential hazards to human health and the environment, and clean up  
20 contamination through a series of stages until it is decided that no further remedial action is warranted.

21  
22 Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other  
23 resources that might be affected by contaminants. It also aids in identification of properties and their  
24 usefulness for given purposes (e.g., activities dependent on groundwater usage might be foreclosed where  
25 a groundwater contaminant plume remains to complete remediation).

26  
27 Toxic substances might pose a risk to human health but are not regulated as contaminants under the  
28 hazardous waste statutes. Included in this category are asbestos-containing materials (ACM), lead-based  
29 paint (LBP), radon, and polychlorinated biphenyls (PCBs). The presence of special hazards or controls over  
30 them might affect, or be affected by, a Proposed Action. Information on special hazards describing their  
31 locations, quantities, and condition assists in determining the significance of a Proposed Action.

32  
33 **Asbestos.** AFI 32-1052, *Facility Asbestos Management*, provides the direction for asbestos management  
34 at Air Force installations. This instruction incorporates by reference applicable requirements of 29 CFR Part  
35 669 et seq., 29 CFR § 1910.1025, 29 CFR § 1926.58, 40 CFR § 61.3.80, Section 112 of the CAA, and  
36 other applicable AFIs and DOD Directives. AFI 32-1052 requires bases to develop an Asbestos  
37 Management Plan to maintain a permanent record of the status and condition of ACM in installation  
38 facilities, as well as documenting asbestos management efforts. In addition, the instruction requires  
39 installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-  
40 related projects. Asbestos is regulated by the USEPA with the authority promulgated under OSHA,  
41 29 U.S.C. § 669 et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air.  
42 USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

43  
44 **Lead-based Paint.** Human exposure to lead has been determined an adverse health risk by agencies such  
45 as OSHA and the USEPA. Sources of exposure to lead are dust, soils, and paint. In 1973, the Consumer  
46 Product Safety Commission established a maximum lead content in paint of 0.5 percent by weight in a dry  
47 film of newly applied paint. In 1978, under the Consumer Product Safety Act (Public Law 101-608, as  
48 implemented by 16 CFR Part 1303), the Consumer Product Safety Commission lowered the allowable lead  
49 level in paint to 0.06 percent (600 ppm). The Act also restricted the use of LBP in nonindustrial facilities.  
50 DOD implemented a ban of LBP use in 1978; therefore, it is possible that facilities constructed prior to or  
51 during 1978 may contain LBP.

52  
53 **Radon.** The US Surgeon General (USSG) defines radon as an invisible, odorless, and tasteless gas, with  
54 no immediate health symptoms, that comes from the breakdown of naturally occurring uranium inside the  
55 earth (USSG, 2005). Radon that is present in soil can enter a building through small spaces and openings,  
56 accumulating in enclosed areas such as basements. No federal or state standards are in place to regulate

1 residential radon exposure at the present time, but guidelines were developed. Although 4.0 picocuries per  
2 liter (pCi/L) is considered an “action” limit, any reading over 2 pCi/L qualifies as a “consider action” limit.  
3 The USEPA and the USSG have evaluated the radon potential around the country to organize and assist  
4 building code officials in deciding whether radon-resistant features are applicable in new construction.  
5 Radon zones can range from 1 (high) to 3 (low).  
6

7 **Polychlorinated Biphenyls.** PCBs are a group of chemical mixtures used as insulators in electrical  
8 equipment, such as transformers and fluorescent light ballasts. Chemicals classified as PCBs were widely  
9 manufactured and used in the United States until they were banned in 1979. The disposal of PCBs is  
10 regulated under the federal TSCA (15 U.S.C. § 2601 et seq., as implemented by 40 CFR Part 761), which  
11 banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems.  
12 Per Air Force policy, all installations should have been PCB-free as of 21 December 1998. In accordance  
13 with 40 CFR Part 761 and Air Force policy, both of which regulate all PCB articles, which are regulated as  
14 follows:

- 15 • Less than 50 ppm—non-PCB (or PCB-free)
  - 16 • 50 ppm to 499 ppm—PCB-contaminated
  - 17 • 500 ppm and greater—PCB equipment (USEPA, 2008)
- 18

19 The TSCA regulates and the USEPA enforces the removal and disposal of all sources of PCBs containing  
20 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated  
21 equipment.  
22

23 The ROI for hazardous materials and wastes, the installation ERP, and toxic materials includes the airfield,  
24 proposed facilities, and ramp space at Eglin AFB.  
25

### 26 3.8.2 *Existing Conditions – Tyndall Air Force Base*

27

28 The information below was summarized from several documents, including management plans, material  
29 surveys, FDEP, the Florida Department of Health, and other State of Florida records, and related  
30 documentation.  
31

#### 32 3.8.2.1 Hazardous Materials and Wastes

33

34 Hazardous and toxic material procurements at Tyndall AFB are approved and tracked by the Tyndall AFB  
35 325th Civil Engineer Squadron (325 CES), Environmental Element (CEIE), which has overall management  
36 responsibility of the installation environmental program. The 325 CES/CEIE supports and monitors  
37 environmental permits, hazardous materials, and hazardous waste storage, spill prevention and response,  
38 and participation on the Environmental Safety and Occupational Health Council (ESOHC) (Tyndall AFB,  
39 2017).  
40

41 The ESOHC is a network of safety, environmental, and logistics experts who work with hazardous materials  
42 Managers, Unit Environmental Coordinators, and other hazardous materials users to ensure safe and  
43 compliant hazardous materials management throughout the base. The 325 CES, Environmental  
44 Compliance (CEIEC) maintains the *Hazardous Waste Management Plan* (Tyndall AFB, 2019) as directed  
45 by AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, and complies with 40 CFR Parts  
46 260 to 272. This plan prescribes the roles and responsibilities of all members of the ESOHC with respect  
47 to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training,  
48 emergency response, and pollution prevention. The *Hazardous Waste Management Plan* establishes the  
49 procedures to comply with applicable federal, state, and local standards for solid waste and hazardous  
50 waste management. The plan outlines procedures for transport, storage, and disposal of hazardous wastes.  
51

52 There is no central Hazardous Material Pharmacy on Tyndall AFB. Tyndall AFB utilizes the Enterprise  
53 Environmental, Safety, and Occupational Health Management Information System (EESOH-MIS) to make  
54 purchases and track inventory of hazardous materials on base. Each command has a Hazardous Materials

1 Coordinator who is responsible for making purchases, tracking inventory, and maintaining records at the  
2 shop level (Tyndall AFB, 2016b).

3  
4 The EESOH-MIS tracks acquisition and inventory control of hazardous materials. Hazardous materials and  
5 petroleum products such as fuels, flammable solvents, paints, corrosives, pesticides, deicing fluid,  
6 refrigerants, and cleaners are used throughout Tyndall AFB for various functions including aircraft  
7 maintenance; aircraft ground equipment maintenance; and ground vehicles, communications infrastructure,  
8 and facilities maintenance (Tyndall AFB, 2017).

9  
10 Hazardous wastes generated at Tyndall AFB include waste flammable solvents, contaminated fuels and  
11 lubricants, paint/coating, stripping chemicals, waste oils, waste paint-related materials, mixed-solid waste,  
12 and other miscellaneous wastes. Certain types of hazardous wastes are subject to special management  
13 provisions intended to ease the management burden and facilitate the recycling of such materials. These  
14 are called “Universal Wastes,” and their associated regulatory requirements are specified in 40 CFR Part  
15 273. Types of waste currently covered under the universal waste regulations include fluorescent light tubes,  
16 hazardous waste batteries, hazardous waste thermostats, and hazardous waste lamps. Tyndall AFB  
17 recycles all lubricating fluids, batteries, and shop rags and hazardous wastes are managed in accordance  
18 with the Tyndall AFB *Hazardous Waste Management Plan* (Tyndall AFB, 2019).

19  
20 Tyndall AFB is classified as a Large-Quantity hazardous waste generator as defined by the USEPA (40  
21 CFR § 260.10), generating more than 2,200 pounds of nonacute hazardous waste per month. Tyndall AFB  
22 operates initial accumulation points (IAPs), where up to 55 gallons (gal) of “total regulated hazardous  
23 wastes” or up to 1 quart of “acutely hazardous wastes” are accumulated. IAP managers are responsible for  
24 properly segregating, storing, characterizing, labeling, marking, packaging, and transferring all hazardous  
25 wastes for disposal from the IAP to the established 90-day storage area according to federal, state, local,  
26 and Air Force regulations. The Hazardous Waste Program Manager is responsible for characterizing and  
27 profiling each waste stream. Tyndall AFB operates one 90-day accumulation site, located in Building 6011  
28 at 233 Florida Avenue, where hazardous waste accumulates before transfer to the DLA Disposition  
29 Services for transportation off-installation for ultimate disposal (Tyndall AFB, 2017; Tyndall AFB, 2013a).

30  
31 An inventory of ASTs and USTs is maintained at Tyndall AFB and includes the location, contents, capacity,  
32 containment measures, status, and installation dates (Tyndall AFB, 2016b). Storage tanks at Tyndall AFB  
33 contain jet fuel, diesel fuel, used cooking oil, used oil, and unleaded gasoline. In addition to the 325 FW,  
34 several of the units listed in **Section 1.1.2** store, transfer, and consume various petroleum products of  
35 significant quantity, such as Jet A, diesel, biodiesel, gasoline, and used oil. Those units are addressed in  
36 the Tyndall AFB *Spill Prevention, Control, and Countermeasures Plan* (Tyndall AFB, 2016b).

37  
38 While the potential for fuel spills exist for each tank and piping system, Tyndall AFB has two areas where  
39 bulk quantities of oil are stored. The Operational Storage Area (Area 400) has the capacity to store  
40 approximately 36,000 gal of diesel, biodiesel, and gasoline and 880,000 gal of Jet A. The Bulk Storage  
41 Area (Area 6000) has the capacity to store almost 2 million gal of Jet A. In addition, the Bulk POL Area  
42 houses a marine transfer operation (Tyndall AFB, 2016b).

### 43 44 3.8.2.2 Environmental Restoration Program

45  
46 Tyndall AFB began its IRP in 1983 with the investigation of possible locations of various Areas of Concern  
47 and Solid Waste Management Units for hazardous waste contamination. Sites that have been contaminated  
48 since 1984 are addressed under the appropriate environmental compliance cleanup program. At present,  
49 Tyndall AFB has 16 active IRP sites. A total of 19 IRP sites have been closed. Access to Tyndall AFB IRP  
50 sites that pose a threat to human health is restricted through land use designation, signage, fencing, and  
51 barriers. During hunting/fishing season, there is limited public access to a few IRP sites, but only in the  
52 uncontaminated portions. Ground disturbing activities that may spread the contamination and/or expose  
53 workers to contamination at IRP sites as well as changes in the land use of IRP sites must be approved by  
54 325 CES, Environmental Flight (CEV) and conducted with special precautions.

1 3.8.2.3 Asbestos and Lead-Based Paint  
2

3 The 325 CES/CEIEC developed the *Asbestos Management and Operations Plan* for Tyndall AFB, which  
4 includes program administration, organizational roles and responsibilities, standard work practices, and  
5 documentation (Tyndall AFB, 2018). To date, Tyndall AFB has not developed an LBP Management Plan.  
6

7 3.8.2.4 Radon  
8

9 The USEPA and the USSG have evaluated the radon potential around the country to organize and assist  
10 building code officials in deciding whether radon-resistant features are applicable in new construction.  
11 Radon zones can range from 1.0 (high) to 3.0 (low). The USEPA radon zone for Bay County, Florida, is  
12 Zone 3 (Low Potential, predicted indoor average level less than 2 pCi/L); however, radon potential  
13 throughout the county can vary (USEPA, 2014). The Florida Department of Health (2018) indicates that  
14 radon levels in Bay County vary from under 2.0 pCi/L (98 percent of reported results in Zone 3) to 2 percent  
15 of results between 2.0 and 3.9 pCi/L (Zone 2). Each zone designation reflects the average short-term radon  
16 measurement that can be expected in a building without the implementation of radon control methods.  
17

18 3.8.2.5 Polychlorinated Biphenyls  
19

20 The high-voltage electrical system and all three associated transformers on the installation are not owned  
21 or operated by Tyndall AFB. All operations are the responsibility of Gulf Power, including inspection and  
22 spill prevention aspects of oil-containing operating equipment (e.g., transformers). Specific PCB materials  
23 at the installation have not been identified. Note that ballasts and starters from light fixtures could contain  
24 PCB-containing material. The disposal of these materials is regulated. If the ballasts are not plainly marked  
25 as “Non-PCB”, the material must be treated as PCB-containing (or be tested and proven to be non-PCB  
26 containing). As facility repairs and demolition occur, the suspected ballasts are identified, removed, and  
27 disposed of in accordance with AFMAN 32-7002.

1

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## CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter presents a detailed analysis of the potential environmental impacts associated with the Proposed Action and No Action Alternative as described in **Chapter 2**. Impacts are described for each ROI previously described in **Chapter 3**. The analysis described in this chapter utilizes operational and environmental information for conditions prior to Hurricane Michael as an expected approximate baseline. The specific criteria for evaluating impacts and assumptions for the analyses are presented under each resource area. Evaluation criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria. All F-22 FTU and T-38 training operations in Warning Areas W-151 and W-470 would end with the departure of the F-22 FTU and T-38s yielding an overall reduction in training operations in W-151 and W-470 under the Proposed Action. The specific criteria for evaluating impacts and assumptions for the analyses are presented under each resource area. Evaluation criteria for most potential impacts were obtained from standard criteria; federal, state, or local agency guidelines and requirements; and/or legislative criteria.

Impacts are defined in general terms and are qualified as adverse or beneficial, and as short- or long-term. For the purposes of this EA, short-term impacts are generally considered those impacts that would have temporary effects. Long-term impacts are generally considered those impacts that would result in permanent effects.

Impacts may be direct or indirect and are described in terms of type, context, duration, and intensity, which is consistent with the CEQ regulations. "Direct effects" are caused by an action and occur at the same time and place as the action. "Indirect effects" are caused by the action and occur later in time or are farther removed from the place of impact but are reasonably foreseeable.

Impacts are defined as

- negligible, the impact is localized and not measurable or at the lowest level of detection;
- minor, the impact is localized and slight but detectable;
- moderate, the impact is readily apparent and appreciable; or
- major, the impact is severely adverse or highly noticeable and considered to be significant.

Major impacts are considered significant and receive the greatest attention in the decision-making process. The significance of an impact is assessed based on the relationship between context and intensity. Major impacts require application of a mitigation measure to achieve a less than significant impact. Moderate impacts may not meet the criteria to be classified as significant, but the degree of change is noticeable and has the potential to become significant if not effectively mitigated. Minor impacts have little to no effect on the environment and are not easily detected; impacts defined as negligible are the lowest level of detection and generally not measurable. Beneficial impacts provide desirable situations or outcomes.

Direct and indirect effects and their significance, as well as the means (e.g., BMPs) for reducing adverse environmental impacts are also discussed for each resource.

### 4.1 AIRSPACE MANAGEMENT AND USE

#### 4.1.1 *Evaluation Criteria*

Adverse impacts on airspace might include modifications to the special use airspace or significantly increasing flight operations within airspaces as a result of the Proposed Action. For the purposes of this EA, an impact is considered significant if it modifies airspace location, dimensions, or aircraft operational capacity.

#### 4.1.2 *Proposed Action*

Under the Proposed Action, an estimated 12 contract ADAIR aircraft would provide training sorties in support of Eglin AFB from Tyndall AFB and in special use airspace as described in **Chapter 2**. An estimated 2,400 contracted sorties would be added to the current number of sorties flown at Tyndall AFB. This number includes training sorties and a smaller number of sorties for aircraft leaving and returning from either

1 maintenance or other deployments. The number of sorties within special use airspace would increase by  
2 an estimated 2,320 sorties over the baseline. Sorties in the special use airspace would include both  
3 subsonic and supersonic flight operations.

4  
5 The addition of an estimated 2,400 sorties at Tyndall AFB is negligible. Compared to the pre-hurricane  
6 baseline, it would increase the annual number of sorties by 8 percent; however, due to the departure of the  
7 F-22 operational squadron, the F-22 FTU and supporting T-38s, the annual number of operations, including  
8 the estimated number of ADAIR sorties, would be approximately 33,352, which is 50 percent lower than the  
9 pre-hurricane baseline. The F-22 FTU temporarily based at Eglin AFB still performs 11,516 airfield operations  
10 annually at Tyndall AFB. As they depart for their permanent location that number would gradually decrease  
11 to zero. This would result in annual airfield operations being reduced to 21,836, which is 67 percent  
12 lower than the pre-hurricane baseline. This change is not expected to impact the operational capacity or  
13 necessitate changes to airspace locations or dimensions around Eglin AFB. Potential impacts on the airspace  
14 around the airfield are expected to be negligible.

15  
16 Contract ADAIR would include an estimated 2,320 sorties in the special use airspace; however, the overall  
17 number of sorties in Warning Areas W-151 and W-470 would be fewer than the baseline because the F-22  
18 FTU and supporting T-38s are scheduled to depart prior to the arrival of contract ADAIR aircraft. Air Force  
19 training flights at night would not increase under the Proposed Action. The addition of contract ADAIR  
20 sorties would not increase the overall number of sorties above the baseline amount, and as such, potential  
21 impacts would not be significant.

22  
23 The MOAs/ATCAAs and Warning Areas proposed for use have the capacity and are in locations with the  
24 dimensions necessary to support the contracted sorties proposed; therefore, potential negligible impacts  
25 on airspace are expected from the implementation of the Proposed Action.

#### 26 27 **4.1.3**      *No Action Alternative*

28  
29 Under the No Action Alternative, contract ADAIR would not perform sorties at Tyndall AFB and in the nearby  
30 airspace. Under the No Action Alternative, the F-22 FTU and associated T-38s would depart Eglin AFB as  
31 analyzed in the Special EA (Air Force, 2019). This would result in fewer sorties and airfield operations and  
32 less airspace use in W-151 and W-470.

### 33 34 **4.2**      **NOISE**

#### 35 36 **4.2.1**      *Evaluation Criteria*

37  
38 Noise impact analysis typically evaluates potential changes to existing noise environments that would result  
39 from implementation of the Proposed Action. At the installation, the 65-dBA DNL is the noise level below  
40 which generally all land uses are compatible with noise from aircraft operations. Areas beyond the 65-dBA  
41 DNL can also experience levels of appreciable noise depending upon training intensity or weather  
42 conditions. In addition, DNL noise contours may vary from year to year due to fluctuations in operational  
43 tempo due to unit deployments, funding levels, and other factors. In the airspace, supersonic flight  
44 operations in the special use airspace have the potential to generate sonic booms.

45  
46 Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive  
47 receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable  
48 noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to  
49 unacceptable noise levels). Projected noise impacts were evaluated from the Proposed Action and No Action  
50 Alternative.

#### 51 52 **4.2.2**      *Proposed Action*

53  
54 The Proposed Action includes contracting for the support of an estimated 12 contractor aircraft to fly an  
55 estimated 2,400 annual sorties in support of the 33 FW and 325 FW at Tyndall AFB. This includes sorties

1 expected for training activities and aircraft leaving for or returning from either maintenance or other  
 2 deployments. Of the estimated 2,400 sorties, approximately 2,320 of those are the training sorties that  
 3 would occur within the special use airspace. Contract ADAIR proposed aircraft specifications are described  
 4 in **Table 2-1**, and six of these aircraft (F-5, F-16, Dassault Mirage, Eurofighter Typhoon, JAS-39 Gripen, or  
 5 MiG-29) were deemed most likely for contract ADAIR at Tyndall AFB. One, or a combination, of these  
 6 aircraft types may be operated by a contractor at Tyndall AFB in support of ADAIR training.

7  
 8 ADAIR aircraft to be used by contractors include six potential aircraft. Specific aircraft that would support  
 9 the mission have not yet been identified by ADAIR contract service providers. Conservatively, the Air Force  
 10 has used the F-18 E/F as an appropriate surrogate for the Eurofighter Typhoon, the loudest of the six  
 11 aircraft, to ensure noise impacts are not underestimated. Flight profiles for contract ADAIR (i.e., schedules  
 12 of altitude use, power setting, and airspeed along each flight track) were reviewed and approved by the Air  
 13 Force and presented in **Appendix B**. All contract ADAIR departures profiles were modeled using  
 14 afterburner or the maximum possible power on all takeoffs. Proposed contract ADAIR flight operations at  
 15 Tyndall AFB and the associated airspace would be identical to existing conditions except for the contract  
 16 ADAIR sorties. Noise analysis of the High Noise Scenario was conducted to analyze changes to the airfield  
 17 noise contours and the special use airspace.

18  
 19 Because it is not known at this time what type of aircraft would be used by contract ADAIR, three aircraft  
 20 scenarios were evaluated (High, Medium, and Low) to represent the range of aircraft types that could be  
 21 selected. For this EA, the High Noise Scenario was analyzed and compared with the pre-hurricane and  
 22 existing conditions. Noise impacts using Medium and Low Noise Scenarios would be less because those  
 23 scenarios would use aircraft that are not as loud as the High Noise Scenario aircraft.

24  
 25 If the Proposed Action were implemented, no significant impacts on the noise environment are expected.  
 26 Potential impacts are summarized in **Table 4-1**, with details regarding these impacts described in **Section**  
 27 **4.2.2.1**.

**Table 4-1. Summary of Potential Noise Impacts**

	<b>Change in Noise</b>
Proposed Action High Noise Scenario	At the base, long-term, minor noise increases (0 to 3 dBA) for most POIs as well as a long-term, moderate noise increase (5 dBA) for a single POI outside the 60-dBA DNL contour. Impacts are primarily localized north and west of Tyndall AFB. Land use compatibility, speech interference, sleep disturbance, and classroom learning events would not markedly change from conditions found currently at and around Tyndall AFB.  Within the airspace, negligible increase in noise from contract ADAIR subsonic flight operations in Warning Areas W-151 and W-470 and the Tyndall B/H, C, and E MOAs and/or supersonic in all special use airspace.
No Action Alternative	None

29  
 30 **4.2.2.1 Tyndall Air Force Base Noise Environment**  
 31

32 Implementation of the High Noise Scenario Proposed Action would result in close to a 20 percent increase in  
 33 the number of operations at Tyndall AFB when compared to existing conditions. Contract ADAIR would fly  
 34 less than 1 percent of the operations during environmental night hours when the effects of aircraft noise are  
 35 accentuated (10:00 p.m. to 7:00 a.m. local time). Runway utilization, flight tracks, and flight track utilization for  
 36 contract ADAIR aircraft would be similar to historic F-22 operations. Proposed annual departure, arrival, and  
 37 closed pattern aircraft operations at Tyndall AFB with the addition of contract ADAIR are summarized in **Table**  
 38 **4-2**. Contract ADAIR would also perform static run-up operations, such as pre/postflight run-ups. This increase  
 39 would not result in significant impacts if the Proposed Action were implemented, especially when compared  
 40 to the 66,360 operations conducted pre-hurricane.  
 41

**Table 4-2. Proposed Annual Aircraft Operations Summary at Tyndall Air Force Base**

Aircraft	Departures		Arrivals		Closed Patterns		Total Operations		
	Day	Night	Day	Night	Day	Night	Day	Night	Total
<i>Contract ADAIR*</i>	2,400	0	2,040	360	648	0	5,088	360	5,488
Based Aircraft	2,902	20	2,896	26	1,131	7	6,929	53	6,982
Transient F-22A	48	0	1,407	7	10,051	51	11,506	58	11,564
Transient F-35A	35	0	35	0	6,830	0	6,999	0	6,999
Other Transients	1,090	20	1,090	20	277	11	2,457	51	2,508
<b>Grand Total</b>	<b>6,475</b>	<b>40</b>	<b>7,468</b>	<b>413</b>	<b>18,937</b>	<b>69</b>	<b>32,979</b>	<b>522</b>	<b>33,541</b>

Notes:

\* One sortie or one closed-pattern equals two aircraft operations. See Sections 2.1.5, 2.1.6, and 3.2.2 for an explanation of closed patterns, sorties, and operations.

ADAIR= adversary air

A person's reaction to noise is dependent on several non-acoustic factors, including the person's perception of the importance of the activity generating the noise and the activity the person is involved in at the time the noise occurs. Several social surveys have found that people are consistently more likely to become annoyed by aircraft noise at higher DNL and are less likely to become annoyed at lower DNL (Schultz, 1978; Finegold, Harris, & Von Gierke, 1994; Miedema & Vos, 1998). The 65-dBA DNL is the noise level below which generally all land uses are considered compatible with noise from aircraft operations. Noise levels greater than 65 dB DNL are considered incompatible with noise-sensitive land uses, such as residential, in accordance with DoD guidelines.

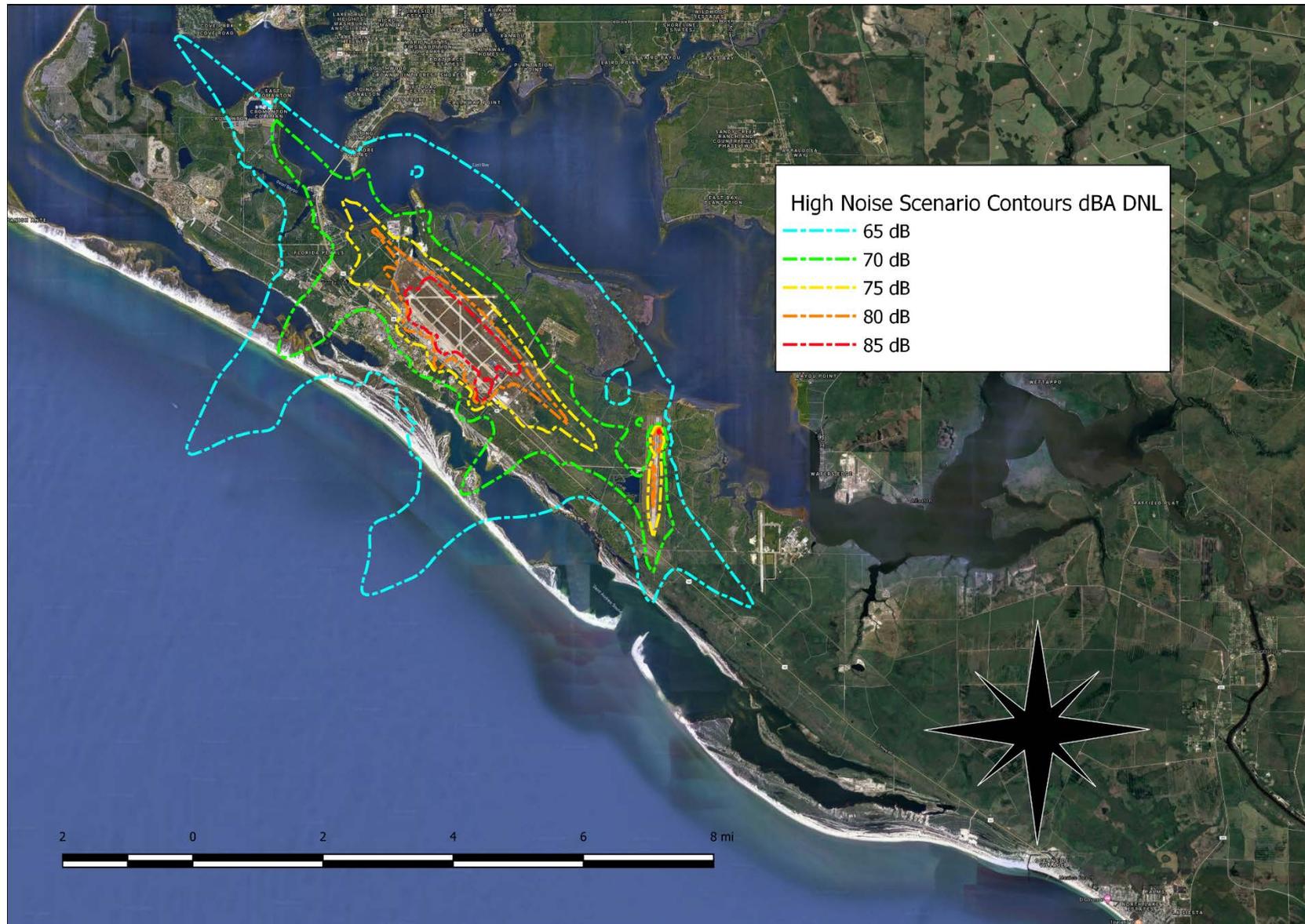
**Figure 4-1** presents the resultant 65- to 85-dBA DNL contours in 5-dBA increments under the proposed High Noise Scenario. Again, this scenario represents the most conservative estimate of noise levels under the Proposed Action; if the Medium or Low Noise Scenarios were implemented then the impacts associated with those alternatives would lessen. The primary changes in noise contour features between the High Noise Scenario and existing conditions is the elongation of the DNL contours along the extended centerlines of the main runways to the northwest and southeast of the installation. This overall increase in noise level is a result of contract ADAIR departures and straight-in arrivals flight operations. A comparison of the DNL noise contours of the High Noise Scenario and the existing conditions is also shown on **Figure 4-2**, and the change in area within noise contours as a result of the High Noise Scenario is tabulated in **Table 4-3**. Under the High Noise Scenario, no changes to the compatibility of land uses within the 65-dBA DNL and greater noise contours would be introduced, therefore, no significant impacts would occur if the Proposed Action High Noise Scenario were implemented.

**Table 4-3. Proposed High Noise Scenario Day-Night Average Sound Level Area Affected on and Surrounding Tyndall Air Force Base**

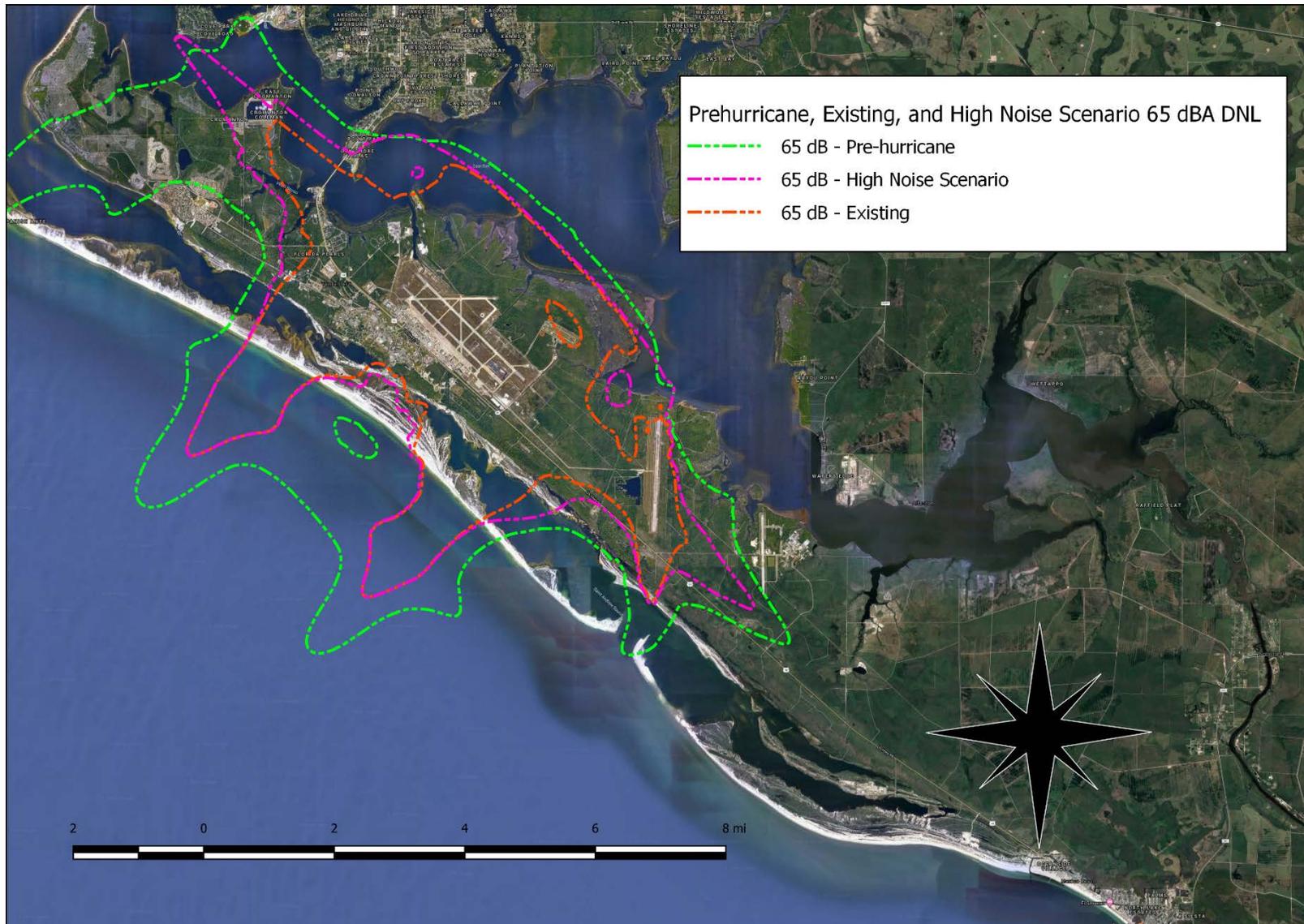
Noise Level (dBA DNL)	Area Within Noise Contour (acres)			
	Pre-Hurricane	Existing	High Noise Scenario	Increase from Existing
65-70	18,382	10,031	12,380	2,349
70-75	8,566	2,927	4,012	1,085
75-80	3,018	1,066	1,506	440
80-85	1,114	442	648	206
>85	797	723	797	74

Notes:

dBA = A-weighted decibel(s); DNL = day-night average sound level



1  
2 **Figure 4-1 High Noise Scenario Day-Night Average Sound Level Contours at Tyndall Air Force Base.**  
3 Source: Google EarthPro 2020.



1  
2 **Figure 4-2 Comparison of High Noise Scenario, Pre-Hurricane, and Existing Day-Night Average Sound Level Contours at Tyndall Air**  
3 **Force Base.**

4 Source: Google EarthPro 2020.

1 Implementation of the High Noise Scenario at representative POIs described in **Section 3.2.2** would  
 2 increase the DNL by an amount ranging from 0 to 5 dBA (**Table 4-4**). Typically, noise level changes of 3  
 3 dBA are noticeable to the human ear. Therefore, when compared to existing conditions, there would be a  
 4 noticeable minor increased DNL at 11 POIs, which would be slightly noticeable and long-term. Impacts  
 5 would be considered minor under the Proposed Action. Areas affected by noise levels 65-dBA DNL and  
 6 greater would still be less when compared to conditions pre-hurricane where six POIs experienced noise  
 7 levels exceeding 65-dBA DNL (see **Table 3-4**).

8  
 9 **Table 4-4. Proposed High Noise Scenario Day-Night Average Sound Level at Representative  
 Points of Interest on and Near Tyndall Air Force Base**

Points of Interest		DNL (dBA)		
ID	Description	Existing	High Noise Scenario	Increase in DNL
C01	Historical St Andrews	48	51	3
C02	Richard Bayou Estates	50	52	2
H01	Bay Medical Center	51	53	2
P01	Shell Island North	53	56	3
P02	Shell Island South	60	60	0
P03	Pelican Point Golf Course	54	59	5
P04	St Andrews State Park	42	43	1
R01	Mexico Beach	47	50	3
R02	Tyndall AFB Dorms	71	72	1
R03	Long Point Condo	59	63	4
R04	Nautical Point RV Park	56	59	3
R05	Parker Heights	54	56	2
R06	Tyndall On-base Housing Area	56	58	2
R07	Panama City Residences near Cove Park	59	62	3
R08	Bay Front Apartments	56	59	3
R09	Eagle Inn Motel	61	66	5
R10	Balfour Beatty Communities	54	57	3
S01	Parker Elementary School	48	50	2
S02	Tyndall Elementary School	70	71	1
S03	Merriam Cherry Street Elementary School	52	55	3
S04	Springfield Elementary School	46	48	2
W01	First Baptist Church of Parker	51	53	2
W02	Callaway Assembly of God	43	45	2
W03	Agape Presbyterian Church	54	57	3

11 Notes:

12 Affected POIs, identified prior to Hurricane Michael, were based off NOISEMAP modeled noise contours and used to calculate the  
 13 POIs within each noise contour.

14 dBA = A-weighted decibel(s); DNL = Day-Night Average Sound Level; POI = point of interest

15  
 16 As identified in **Section 3.2.2**, the DNL metric is useful for describing the noise environment at a location  
 17 with a single number, but it does not provide a complete description of the noise environment. Accordingly,  
 18 this EA uses several supplemental noise metrics (e.g., number of events with potential to interfere with  
 19 speech, noise interference with learning) to provide an expanded description of the noise experience. For  
 20 purposes of this analysis, it was conservatively assumed that any event exceeding 50 dB has some  
 21 potential to interfere at least momentarily with speech and other forms of communication involving listening.  
 22 Under the High Noise Scenario Proposed Action, all of the POIs would experience an increase of less than  
 23 one event per average daytime hour when compared to existing conditions (**Table 4-5**). While the increase  
 24 would be long term, it would not result in significant impacts for noise events interfering with speech if the  
 25 Proposed Action High Noise Scenario were implemented.

**Table 4-5. Number of Outdoor Noise Events With Potential to Interfere With Speech Under Existing Conditions and High Noise Scenario Proposed Action**

Points of Interest		Existing Events	High Noise Scenario Events	Increase in Events
ID	Description			
C01	Historical St Andrews	0.8	1.2	0.4
C02	Richard Bayou Estates	1.9	2.6	0.7
H01	Bay Medical Center	1.5	2.0	0.5
P01	Shell Island North	1.1	1.6	0.5
P02	Shell Island South	1.7	2.4	0.7
P03	Pelican Point Golf Course	1.5	2.1	0.6
P04	St Andrews State Park	0.8	1.2	0.4
R01	Mexico Beach	0.6	1.0	0.4
R02	Tyndall AFB Dorms	9.4	10.3	0.9
R03	Long Point	3.0	3.7	0.7
R04	Nautical Point RV Park	2.9	3.6	0.7
R05	Parker Heights	2.3	3.0	0.7
R06	Tyndall On-base Housing Area	3.2	3.8	0.6
R07	Panama City Residences near Cove Park	2.3	3.0	0.7
R08	Bay Front Apartments	2.3	3.0	0.7
R09	Eagle Inn Motel	3.1	4.0	0.9
R10	Balfour Beatty Communities	3.3	3.9	0.6
W01	First Baptist Church of Parker	2.3	2.5	0.2
W02	Callaway Assembly of God	1.6	2.1	0.5
W03	Agape Presbyterian Church	2.6	3.0	0.4

Nighttime flying, which is required as training for certain missions, has an increased likelihood of causing sleep disturbance (see **Section 3.2.2**). The overall percent probability of awakening at least once per night reflects all flying events that occur between 10:00 p.m. and 7:00 a.m., when most people sleep. The analysis also accounts for standard building attenuation of 15 dB and 25 dB with windows open and closed, respectively. Sleep disturbance probabilities listed for parks are not intended to imply that people regularly sleep in parks, but instead are indicative of impacts in nearby residential areas. Flight operations between 10:00 p.m. and 7:00 a.m. make up less than 1 percent of total operations under existing conditions and about 2 percent under the High Noise Scenario. The estimated percentage of people awakened at least once per night by aircraft noise is presented in **Table 4-6**. Under the High Noise Scenario Proposed Action, there would be a negligible, less than 1 percent probability increase to six of the 12 POIs; the other six POIs would not have any noticeable increases in the probability of awakening. While this increase would be long term it would not introduce significant impacts.

**Table 4-6. Percent Probability of People Awakened by Aircraft Noise at Least Once Per Night Pre-Hurricane and Existing Conditions at Points of Interest**

Points of Interest		Existing (%)	High Noise Scenario (%)	Percent Increase
ID	Description			
P01	Shell Island North	0	0.2	0.2
P04	St Andrews State Park	0	0.3	0.3
R01	Mexico Beach	0.1	0.1	0
R02	Tyndall AFB Dorms	0.1	0.2	0.1
R03	Long Point	0.1	0.2	0.1
R04	Nautical Point RV Park	0.1	0.2	0.1
R05	Parker Heights	0.1	0.1	0
R06	Tyndall On-base Housing Area	0.1	0.1	0
R07	Panama City Residences near Cove Park	0.1	0.1	0
R08	Bay Front Apartments	0.1	0.2	0.1
R09	Eagle Inn Motel	0.1	0.1	0
R10	Balfour Beatty Communities	0.1	0.1	0

Noise interference with learning in schools is of particular concern because noise can interrupt communication or interfere with concentration. As presented in **Table 4-7**, exterior school-day noise levels are at or below the 60 dB  $L_{eq-8hr}$  criteria level at all schools except Tyndall Elementary School under existing conditions. If the High Noise Scenario were implemented, the number of events at Tyndall Elementary School with potential to interfere with speech per average daytime hour would increase no more than one event per hour with windows open or closed. Under pre-hurricane conditions, which are described for a point of reference, the number of events with potential to interfere with speech at Tyndall Elementary School was six with windows open or five with windows closed. If the High Noise Scenario Proposed Action were implemented, the number of speech interference events would increase but not to such a level as to negatively impact learning at Tyndall Elementary School and would be long-term but minor and not significant.

**Table 4-7. Noise Levels at Schools Near Tyndall Air Force Base under Pre-Hurricane and Existing Conditions**

Location Description	Outdoor $L_{eq-8hr}$		Speech-Interference Events per Hour with Windows Open		Speech-Interference Events per Hour with Windows Closed	
	Existing	High Noise Scenario	Existing	High Noise Scenario	Existing	High Noise Scenario
Parker Elementary School	< 60 dB	< 1	< 1	1.2	< 1	< 1
Tyndall Elementary School	73	72	3.2	3.3	1.4	2.1
Merriam Cherry Street Elementary School	60.3 dB	< 1	< 1	1.1	< 1	< 1
Springfield Elementary School	60.4 dB	< 1	< 1	< 1	< 1	< 1

Notes: NA=Not Applicable

As presented in **Section 3.2.1**, the NA metric is the only supplemental metric that combines single-event noise levels with the number of aircraft operations. In essence, it answers the question of how many aircraft (or range of aircraft) fly over a given location or area at or above a selected threshold noise level. It provides additional information about the acoustic environment and is valuable in helping to describe noise exposure to the community. A threshold level and metric are selected that best meet the need for each situation.

1 Under existing conditions, with windows closed Tyndall Elementary School experiences about four  
2 NA50L<sub>max</sub> events per hour and up to two events per hour at the other three school. Under the Proposed  
3 Action High Noise Scenario, NA50L<sub>max</sub> ranges from up to five events per hour at Tyndall Elementary School  
4 and less than three events at the other schools. This minor increased NA50L<sub>max</sub> would be long term but  
5 would be considered of minor significance.

6  
7 DoD policy for assessing hearing loss risk in the community pursuant to NEPA is to use the 80-dB DNL  
8 noise contour to identify populations at the most risk of potential hearing loss (DoD Noise Working Group,  
9 2013). No residences on or off base would be exposed to noise levels exceeding 80 dB DNL under the  
10 High Noise Scenario Proposed Action. Therefore, the risk of noise-induced hearing loss in the community  
11 is negligible, and potential hearing loss calculation was not conducted.

#### 4.2.2.2 Airspace Noise Environment

12  
13  
14  
15  
16 Under the High Noise Scenario, contract ADAIR would perform an estimated 2,320 annual airspace  
17 operations in the special use airspace. Contract ADAIR would only operate in the same MOAs/ATCAAs  
18 and Warning Areas already used (pre-hurricane and existing) by based Tyndall AFB aircraft. The Tyndall  
19 MOAs/ATCAAs would receive approximately 5 percent of sorties originating from Tyndall AFB while the  
20 Warning Areas would receive approximately 95 percent. A summary of estimated annual airspace  
21 operations is presented in **Table 4-8**.

22  
23 Using the methods described in **Section 3.2.1.2** for MR\_NMAP, the L<sub>dnmr</sub> noise levels from the proposed  
24 High Noise Scenario were calculated from the subsonic aircraft operations underneath the appropriate  
25 portions of the Tyndall MOAs/ATCAAs and Warning Areas W-151 and W-470. Subsonic noise levels  
26 modeled for Tyndall AFB-based aircraft and contract ADAIR aircraft under the High Noise Scenario using  
27 MR\_NMAP differ negligibly from the levels reported in **Table 3-11**. Due to the potential negligible change  
28 in noise levels and the overall low L<sub>dnmr</sub> noise levels from the proposed High Noise Scenario, there are no  
29 significant impacts expected to the noise environments of any of the listed airspace.

30  
31 Supersonic operations are allowed in Warning Areas W-151 and W-470 and the Tyndall B/H, C, and E  
32 MOAs above 10,000 ft MSL. Airspace sorties require aircraft to exceed Mach 1.0 (supersonic) for brief  
33 periods of time for approximately 10 percent of total flight time. This is equivalent to approximately  
34 3.5 minutes of supersonic flight activity per sortie. That percentage of supersonic flight during training  
35 sorties is not expected to change with the addition of contract ADAIR aircraft.

36  
37 For cumulative sonic boom exposure under supersonic air combat training arenas, the BooMap program  
38 as described in **Section 3.2.1.2** was used to model the cumulative CDNL exposure in the special use  
39 airspace proposed for use under the Proposed Action. The sonic boom noise levels modeled for the High  
40 Noise Scenario are unlikely exceed the 45-dBA CDNL under any primary use airspace unit.

41  
42 Single event sonic boom levels were estimated, using the PCBoom program also described in **Section**  
43 **3.2.1.2**, directly undertrack for the F-22 and T-38A aircraft at various altitudes and Mach numbers. The  
44 single event levels reported include overpressure (psf) and CSEL (dB). Sonic boom levels estimated for  
45 contract ADAIR supersonic flights in Warning Areas W-151 and W-470 and the Tyndall B/H, C, and E MOAs  
46 and ATCAAs are shown on **Table 4-9** along with the F-22 and T-38A sonic boom levels for comparison.

47  
48 The sonic boom levels shown on **Table 4-9** are the loudest levels computed at the center of the footprint  
49 for the constant Mach, level flight conditions indicated. Supersonic flights in Warning Areas W-151 and  
50 W-470, the Tyndall B/H, C, and E MOAs, and ATCAAs occur at high altitudes but would still generate  
51 booms that are certain to be noticed. The location of these booms would vary with changing flight paths  
52 and weather conditions, so it is unlikely that any given location would experience these undertrack levels  
53 more than once over multiple events. Overpressure levels, directly under the flight path, estimated for these  
54 airspaces would range from 6.2 to 0.9 psf depending on the flight conditions. Public reaction (limited to  
55 vessels 15 NM from shore) may occur with overpressures above 1 psf, and in rare instances, damage to  
56 structures have occurred at overpressures between 2 and 5 psf (NASA, 2017). People located farther away

1 from the supersonic flight paths, who are still within the primary boom carpet, might also be exposed to  
 2 levels that may be startling or annoying, but the probability of this decreases the farther away they are from  
 3 the flight path. People located beyond the edge of the boom carpet are not expected to be exposed to sonic  
 4 boom although post-boom rumbling sounds may be heard. The addition of contractor aircraft operating at  
 5 supersonic speeds means that the number of sonic booms heard would likely increase; however, potential  
 6 impacts associated with sonic booms are still expected to be negligible under the Proposed Action and  
 7 would not be considered significant.

8  
 9 **Table 4-8. Proposed Annual Airspace Operations Summary from Tyndall and Eglin Air Force Base**

Airspace	Current Altitude <sup>1</sup>	Baseline Training Sorties <sup>2</sup>	Projected Contract ADAIR Training Sorties <sup>3</sup>	Projected Total Sorties
W-151	Surface to Unlimited	12,191	947	13,479
W-470	Surface to Unlimited (or as assigned); floor restricted to 5,000 ft MSL in ACMI East and West		341	
Rose Hill MOA/ ATCAA	8,000 ft MSL to FL230	744	183	927
Eglin E MOA / ATCAA	Surface to Unlimited	3,416	825	4,241
R-2419A / R-2519A	Surface to Unlimited	180	0	180
Tyndall E MOA (Carrabelle ATCAA)	300 ft AGL to 17,999 ft MSL (FL180 to FL230 or as assigned)	9,307	12	9,319
Tyndall B and H MOAs (Compass Lake ATCAA)	9,000 ft MSL to 17,999 ft MSL (FL180 to FL230 or as assigned)	2,628	3	2,631
Tyndall C MOA (Compass Lake ATCAA)	300 ft AGL to 6,000 ft MSL (FL180 to FL230 or as assigned)	6,711	9	6,720
<b>Total Proposed Airspace Sorties</b>		<b>35,177</b>	<b>2,320</b>	<b>37,497</b>

Source: 96 CEG/CEIEA (96th Civil Engineer Group/Environmental Assets), personal communication, 19 April 2018

Notes:

<sup>1</sup> No change to current minimum flight altitude is proposed.

<sup>2</sup> Based on 33rd Fighter Wing, 325 FW, 85th Test Squadron, 53rd Wing, 96th Test Wing. The baseline includes the F-22 and T-38 aircraft from Tyndall AFB analyzed in the Special Environmental Assessment and excludes the Navy F-35C aircraft expected to depart Eglin Air Force Base in July 2019.

<sup>3</sup> A total of 80 of the 2,400 contractor sorties would not be traveling from Tyndall AFB to the airspace; they would return to contractor's base for maintenance or pilot proficiency training.

ADAIR = adversary air; AFB = Air Force Base; ATCAA= Air Traffic Control Assigned Airspace; FL = flight level (vertical altitude expressed in hundreds of feet); ft = feet; MOA = Military Operations Area; MSL = mean sea level; W = Warning Area

10  
 11  
 12  
 13  
 14  
 15  
 16  
 17

**Table 4-9. Warning Areas W-151 and W-470 and Tyndall B/H, C, and E Military Operations Areas (Compass Lake Air Traffic Control Assigned Airspace): Sonic Boom Levels Undertrack for Aircraft in Level Flight at Mach 1.2 and 1.5**

Aircraft	Altitude (feet above mean sea level)			
	10,000	20,000	30,000	40,000
<b>Mach 1.2</b>				
<b>Overpressure (psf)</b>				
F-22	5.4	2.8	1.9	1.4
T-38A/B	3.3	1.8	1.2	0.9
Eurofighter Typhoon <sup>1</sup>	5.1	2.7	1.8	1.4
Dassault Mirage <sup>2</sup>	4.2	2.2	1.5	1.1
JAS 39 Gripen <sup>3</sup>	4.2	2.2	1.5	1.1
<b>C-Weighted Sound Exposure Level (dB)<sup>1</sup></b>				
F-22	116	111	107	105
T-38A/B	112	107	103	101
Eurofighter Typhoon <sup>1</sup>	116	110	107	105
Dassault Mirage <sup>2</sup>	114	109	105	103
JAS 39 Gripen <sup>3</sup>	114	109	105	103
<b>Mach 1.5</b>				
<b>Overpressure (psf)</b>				
F-22	6.2	3.2	2.1	1.5
T-38A/B	3.8	2.0	1.3	0.9
Eurofighter Typhoon <sup>1</sup>	5.9	3.1	2.0	1.5
Dassault Mirage <sup>2</sup>	4.9	2.5	1.6	1.2
JAS 39 Gripen <sup>3</sup>	4.9	2.5	1.6	1.2
<b>C-Weighted Sound Exposure Level (dB)<sup>1</sup></b>				
F-22	117	112	108	105
T-38A/B	113	108	104	101
Eurofighter Typhoon <sup>1</sup>	117	111	108	105
Dassault Mirage <sup>2</sup>	115	110	106	103
JAS 39 Gripen <sup>3</sup>	115	110	106	103

Notes:

<sup>1</sup> As modelled with the surrogate F-18E/F

<sup>2</sup> As modelled with the surrogate F-16C

<sup>3</sup> As modelled with the surrogate F-16A

C-weighted Sound Exposure Level – Sound Exposure Level with frequency weighting that places more emphasis on low frequencies below 1,000 hertz

dB = decibel(s); psf = pound(s) per square foot

### 4.2.3 No Action Alternative

Under the No Action Alternative, contract ADAIR would not perform sorties at Tyndall AFB and in the nearby airspace. Under the No Action Alternative, there would be no change to the existing noise environment.

#### *Airspace Noise Environment*

Under the No Action Alternative, the subsonic and supersonic airspace noise environment would be identical to the subsonic and supersonic airspace noise environment under the existing conditions for the MOAs/ATCAAs. Under the No Action Alternative, the subsonic noise environment in Warning Area W-151 would be 60 dB L<sub>dnmr</sub> (1 dB lower than the existing conditions). Because there would be no increase in noise levels under the No Action Alternative, no significant impacts would be expected under the No Action Alternative.

1 4.3 SAFETY

2  
3 4.3.1 *Evaluation Criteria*

4  
5 Impacts from implementation of the Proposed Action are assessed according to the potential to increase  
6 or decrease safety risks to personnel, the public, property, or the environment. Adverse impacts on safety  
7 might include implementing contractor flight procedures that result in greater safety risk or constructing new  
8 buildings within established Q-D safety arcs. For the purposes of this EA, an impact is considered significant  
9 if the proposed safety measures are not consistent with AFOSH and OSHA standards resulting in  
10 unacceptable safety risks.

11  
12 Safety concerns associated with ground, explosive, and flight activities are considered in this section.  
13 Ground safety considers issues associated with ground operations and maintenance activities that support  
14 operations including arresting gear capability, jet blast/maintenance testing, and safety danger zones.  
15 Ground safety also considers the safety of personnel and facilities on the ground that may be placed at risk  
16 from flight operations in the vicinity of the airfield and in the airspace.

17  
18 CZs and APZs around the airfield restrict the public's exposure to areas where there is a higher accident  
19 potential. Although ground and flight safety are addressed separately, in the immediate vicinity of the  
20 runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns.  
21 Explosives safety relates to the management and safe use of ordnance and munitions. Flight safety  
22 considers aircraft flight risks such as midair collision, BASH, and in-flight emergency requirements.  
23 Contractor planes would follow Air Force safety procedures and aircraft specific emergency procedures  
24 based on the aircraft design. Basic airmanship procedures also exist for handling any deviations to ATC  
25 procedures due to an in-flight emergency; these procedures are defined in AFI 11-202 (Volume 3) and  
26 established aircraft flight manuals. The Flight Crew Information File is a safety resource for aircrew day-to-  
27 day operations which is composed of air and ground operation rules and procedures.

28  
29  
30 4.3.2 *Proposed Action*

31  
32 Ground, explosive, and flight safety associated with implementation of the Proposed Action are described  
33 in the following sections. Contract ADAIR safety procedures described in this section are mandated by the  
34 *Performance Work Statement for the Combat Air Forces (CAF) Contracted Air Support (CAF CAS) (PWS)*  
35 (Air Force, 2018d).

36  
37 **Ground Safety**

38  
39 Under the Proposed Action, limited contractor aircraft maintenance and testing would occur on the aircraft  
40 parking ramp or in the hangar and would be consistent with current aircraft maintenance activities on  
41 Tyndall AFB. No unique maintenance activities would be associated with the contract ADAIR aircraft. All  
42 scheduled depot-level or other heavy maintenance requirements would occur at off base contractor  
43 facilities.

44  
45 *Emergency Response*

46  
47 For initial emergency response involving a contract ADAIR aircraft, the Air Force would provide emergency  
48 responders (Airport Firefighter) trained on the applicable mission design series they are providing. For crash  
49 response, the DOD would provide on-field aircraft CDDAR. For events occurring off-base, civilian  
50 authorities (city, county, or state) would be first on scene. After the initial response, the contractor would be  
51 required to facilitate crash site security and clean-up. The contractor would be responsible to cooperate  
52 with the Air Force or the National Transportation Safety Board investigation, depending upon circumstances  
53 of the incident.

54  
55 The contractor emergency response would include the following:

- 1       • Establish a CDDAR program that is fully integrated into the host operating location's CDDAR  
2       program. The contractor would provide technical expertise and facilitate the host operating  
3       location's response and recovery capability of contractor-owned aircraft, consistent with the  
4       following considerations: (1) urgency to open the runway for operational use; (2) prevention of  
5       secondary damage to the aircraft; and (3) preservation of evidence for mishap or accident  
6       investigations in accordance with AFI 91-202 and AFI 91-204; National Transportation Safety  
7       Board guidelines; and any local operating location guidance, as applicable. The contractor would  
8       ensure the host operating location's CDDAR personnel receive familiarization training on  
9       contractor aircraft and procedures prior to commencing local flying operations, at permanent and  
10      temporary duty operating locations.
- 11      • The contractor would develop an egress/cockpit familiarization training program to ensure all host  
12      operating location's nonegress personnel (e.g., emergency response personnel, fire department,  
13      CDDAR) who may access contractor aircraft cockpits, equipped with egress systems, receive  
14      initial and annual refresher training.

### *Safety Zones*

17      Under the Proposed Action, safety zones around the airfield would not change.

### *Arresting Gear Capacity*

21      Contract ADAIR aircraft would be compatible with the arresting systems on the airfield; or able to operate  
22      on the airfield without interference to the existing arresting system. There would be no need to change or  
23      modify the existing arresting gear. There would be no impacts on arresting gear capability for the  
24      implementation of the Proposed Action.

26      No significant impacts on ground safety are anticipated to occur under the Proposed Action provided the  
27      contractor establishes a CDDAR program and all applicable AFOSH and OSHA requirements are  
28      implemented.

### **Explosives Safety**

32      Under the Proposed Action, the 325 MXS would support contract ADAIR daily training operations with the  
33      maintenance and delivery of countermeasure chaff and flares. This support would be provided by trained  
34      and certified personnel following Air Force safety guidance and technical orders. Trained and certified  
35      contract ADAIR personnel would be responsible for the loading and unloading of countermeasures on  
36      contract ADAIR aircraft and would follow approved safety measures outlined in the PWS. Contract ADAIR  
37      personnel would also be responsible for the maintenance of captive air training missiles and any ejector  
38      cartridges as contractor-provided equipment.

40      There may be rare occasions in which egress CADs and PADs may need to be removed from the aircraft  
41      for maintenance. In accordance with AFMAN 91-201, 11.15, when necessary, units may license a limited  
42      quantity of in-use egress explosive components of any Hazard Division explosive in the egress shop after  
43      removal from aircraft undergoing maintenance. This limit would not exceed the total number of complete  
44      sets for the number of aircraft in maintenance and the net explosive weight is limited. Contract ADAIR would  
45      work with the Wing Safety Office to obtain a license, if needed, to store egress CADs and PADs. Short-  
46      term storage could be provided at either the 325 MXS Munitions Storage Area provided a courtesy storage  
47      agreement is created and space is available. Short-term storage would be limited and only needed in the  
48      event of an emergency or unforeseen occurrence such as the issuance of a suspension or restriction egress  
49      equipment or munitions. All scheduled maintenance would occur at the contractor's off-base Central Repair  
50      Facility. CAD/PAD items are typically replaced just prior to expiration of the service life, which is typically  
51      part of aircraft scheduled maintenance. If temporary storage of contract ADAIR CAD/PAD items within the  
52      Wing munitions storage area is needed, they would be stored in facilities sited in the Explosive Safety plan  
53      for the type and amount of explosives to be stored.

1 The loading and unloading of countermeasure chaff and flares would occur on the aircraft parking ramp.  
2 The proposed ramp area for contract ADAIR aircraft is authorized for chaff and flare operations (Hazard  
3 Class 1.3) in accordance with AFMAN 91-201 para 12.47.2 and 12.47.3.

4  
5 No significant impacts on explosive safety are anticipated to occur under the Proposed Action provided  
6 contract ADAIR personnel are trained and all applicable safety guidelines are implemented. Q-D arcs would  
7 not change.

## 8 9 **Flight Safety**

10 The potential for aircraft accidents is a primary public concern with regard to flight safety. Such accidents  
11 may occur as a result of midair collisions, collisions with manmade structures or terrain, mechanical failure,  
12 weather-related accidents, pilot error, BASH, or strikes from defensive countermeasures used during  
13 training. Under the Proposed Action, contract ADAIR would be required to strictly conform to the flight safety  
14 rules directed by the Operations Group Commander. In addition, the PWS stipulates the following  
15 requirements for contract ADAIR:

- 16 • Contractor Flight Operations would respond to and follow ATC vectors from approved facilities per  
17 FAA and AFI guidelines.
- 18 • Contract ADAIR would be conducted under positive tactical control. Pilots would be responsible to  
19 respond to tactical vectors and instructions by the applicable controlling authority (Ground  
20 Controller Intercept, Baron Controllers, Range Control Officer, Joint Terminal Attack Controller,  
21 etc.). If positive control is unavailable, mission flights would remain autonomous and adhere to  
22 the briefed presentations and Special Instructions.
- 23 • Contract ADAIR aircraft would
  - 24 ○ be equipped with applicable communication and navigation capability to operate in the National  
25 Airspace Structure under FAA IFR and aircraft operating limitations (if applicable) and  
26 International Civil Aviation Organization equipment prerequisites;
  - 27 ○ have at least one type of FAA-approved Navigation System such as a Tactical Air Navigation,  
28 Automatic Direction Finder Receiver System, with Automatic Direction Finder indicator; Very  
29 High Frequency Omni Directional Range; or Global Positioning System/Long Range  
30 Navigation;
  - 31 ○ have sufficient precision approach instrumentation (compatible with standard Air Force  
32 instrument landing systems) to permit operations down to 300-ft ceilings and 1-statute-mi  
33 visibility; and
  - 34 ○ have at least two functional voice radios operating in either the very high frequency/ultra-high  
35 frequency bands, and one must be ultra-high frequency.

### 36 37 *Bird/Wildlife-Aircraft Strike Hazards*

38 Contractor operations would not follow government BASH procedures; they follow the PWS-directed Flight  
39 Operations Procedures and Quality Management System per the references above. In this case, the  
40 contractor's BASH plan would be part of the Quality Management System and be integrated with the host  
41 Wing's plan. It is expected the contract ADAIR BASH plan would very closely mirror and, in fact, may be  
42 an exact copy of the Wing's BASH plan. While it is not required to be so, the contract ADAIR BASH plan  
43 would comply with the FAA Wildlife Hazard Mitigation Program.

44  
45  
46  
47 No significant impacts on airspace/flight safety are anticipated to occur under the Proposed Action provided  
48 that contractor flight safety rules are followed and all applicable AFOSH and OSHA requirements are  
49 implemented.

### 50 51 **4.3.3 No Action Alternative**

52 Under the No Action Alternative, contract ADAIR would not perform sorties at Tyndall AFB and in the nearby  
53 special use airspace. Under the No Action Alternative, there would be no change to safety.

1 4.4 AIR QUALITY

2  
3 4.4.1 Evaluation Criteria

4  
5 The CAA Section 176(c), *General Conformity*, requires federal agencies to demonstrate that their  
6 proposed activities would conform to the applicable SIPs for attainment of the NAAQS. General conformity  
7 applies to nonattainment and maintenance areas. If the emissions from a federal action proposed in a  
8 nonattainment area exceed annual *de minimis* thresholds identified in the rule, a formal conformity  
9 determination is required of that action. The thresholds are more restrictive as the severity of the  
10 nonattainment status of the region increases.

11  
12 This section discusses the potential effects of the Proposed Action on air quality within the ROIs. The  
13 Mobile-Pensacola-Panama City-Southern Mississippi AQCR is considered an attainment area. Because of  
14 the attainment status, the general conformity rule would not apply to any of the ROIs. As a result, air quality  
15 impacts are assessed by comparing projected contract ADAIR emissions to current Tyndall AFB emissions  
16 and county emissions. In addition, although general conformity does not apply, the applicability criteria of  
17 the rule are evaluated against projected contract ADAIR emissions as an additional significance indicator.  
18 Thus, project emissions of PM<sub>2.5</sub>, PM<sub>10</sub>, CO, SO<sub>2</sub>, NO<sub>x</sub>, and VOCs were compared against the conformity  
19 rule *de minimis* thresholds of 100 tpy. In nonattainment and maintenance areas, emissions at or above 100  
20 tpy are considered significant, particularly as this threshold triggers full conformity analysis. Emissions  
21 below 100 tpy are considered moderate or, if very low, minor.

22  
23 Operations in the Warning Areas would occur mostly outside the state jurisdictional boundary and outside  
24 the AQCR. Warning Area W-151 begins 3 NM from the coastline; the state jurisdictional boundary for Florida  
25 extends 9 NM from the coastline. Thus, there is a 6-NM overlap in state jurisdiction and the Warning Areas;  
26 however, the Warning Areas extend roughly 100 NM into the Gulf. As a result, it was assumed that  
27 approximately 6 percent of the ADAIR emissions in the Warning Areas would occur in the 6-NM overlap  
28 area.

29  
30 The Rose Hill MOA and Tyndall B and H MOAs were not included in the analysis, as all ADAIR training for  
31 that MOA would occur above 3,000 ft. As described in **Section 3.4.1**, only air operations occurring at or  
32 below 3,000 ft AGL are considered in the impact analysis; thus, only the Tyndall AFB airfield, Tyndall C and  
33 E MOAs, Eglin E MOA, and Warning Areas W-151 and W-470 were evaluated.

34  
35 The Air Conformity Applicability Model (ACAM) (version 5.0.13a) was used to provide emissions estimates  
36 for contract ADAIR airfield operations, maintenance activities, worker commutes, and fueling operations in the  
37 vicinity of the airfield and for flight operations in the airspace. ACAM was developed by the Air Force (Air  
38 Force, 2017a) and provides estimated air emissions from proposed federal actions for each specific criteria  
39 and precursor pollutant as defined in the NAAQS. Assumptions of the model are discussed in **Appendix C**.  
40 ACAM uses the procedures established by the Air Force as provided in *Air Emissions Guide for Air Force*  
41 *Mobile Sources* (Air Force, 2018a) and the *Air Emissions Guide for Air Force Stationary Sources* (Air Force,  
42 2018b). Emission calculations in the stationary guide often reflect the use of emission factors published in  
43 USEPA's AP-42. For aircraft, operational modes (including taxi/idle [in and out], take off, climb out, approach,  
44 and pattern flight that includes TGO operations) are used as the basis of the emission estimates. By default,  
45 ACAM only accounts for emissions occurring at or below 3,000 ft (within the mixing layer). The mixing layer  
46 extends from ground level up to the point at which the vertical mixing of pollutants decreases significantly.  
47 The USEPA recommends that a default mixing layer of 3,000 ft be used in aircraft emission calculations  
48 (40 CFR § 93.153[c][2]); therefore, aircraft emissions released above 3,000 ft were not included in the  
49 analysis. The emissions associated with the use of flares at or below 3,000 ft within the Warning Areas were  
50 estimated using draft emission factors found in AP-42 Section 15.8 (USEPA, 2009).

51  
52 The basis for the air emissions performed is summarized in **Table 4-10**. Emissions were calculated  
53 separately for the airfield operations, Tyndall C and E MOAs, the Eglin E MOA, and Warning Areas W-151  
54 and W-470.

1 Details regarding impacts specific to the Proposed Action and No Action Alternative are described in  
2 **Sections 4.4.2 and 4.4.3.**

3  
4  
5

**Table 4-10. Basis of Air Emission Calculations**

Location	Type of Operation	Number of Sorties per Year	Ground Operation Emission Sources
Tyndall Airfield	LTO Cycles	2,400	Auxiliary power unit equipment, AGE, personal vehicle use, aircraft maintenance (solvent use), fuel handling and storage, emergency generator, aircraft trim tests (24 per aircraft)
	TGO Cycles	324 <sup>1</sup>	
Eglin E MOA	Sorties @ ≤3,000 feet	1,080 <sup>2,3</sup>	Not Applicable
Rose Hill MOA	Sorties @ ≥8,00 feet	Not Applicable – No Analysis <sup>4</sup>	Not Applicable
Tyndall C MOA	Sorties @ ≤3,000 feet	82	Not Applicable
Tyndall E MOA	Sorties @ ≤3,000 feet	82	Not Applicable
Tyndall B and H MOAs	Sorties @ >9,000 feet	Not Applicable – No Analysis <sup>4</sup>	Not Applicable
Warning Area W-151	Sorties @ ≤3,000 feet	1,080 <sup>2,3</sup>	Not Applicable
Warning Area W-470	Sorties @ ≤3,000 feet	2,396	Not Applicable

6 Notes:  
7 <sup>1</sup> 5 percent of on-airfield daytime sorties (2,160) are expected to include multiple patterns for contractor proficiency. Each of those 5  
8 5 percent sorties is assumed to include three TGO/low approaches.  
9 <sup>2</sup> 45 percent of all sorties (1,080).  
10 <sup>3</sup> Impacts include flare use below at and below 3,000 ft.  
11 <sup>4</sup> Sorties occur above the mixing height. No emissions calculated.  
12 AGE = Aerospace Ground Equipment; LTO = landing and takeoff; MOA = Military Operations Area; TGO = touch and go

13  
14  
15  
16

17 **4.4.2 Proposed Action**

18

19 As described in **Section 1.1.3**, the recovery and rebuilding efforts are anticipated to take several years and  
20 the base is expected to return to full operational status after the recovery efforts are complete. For the  
21 purposes of this analysis it is assumed that there would be no new construction as a result of the contract  
22 ADAIR program. Contract ADAIR generated air emissions would be strictly the result of the contracted  
23 training operations.

24

25 No significant short-term or long-term effects to air quality would be expected from the proposed action.  
26 The only new air emissions that will be associated with the proposed action are direct and indirect  
27 emissions sources resulting from the flight operations and additional personnel. Emissions from the flight  
28 operations for this Action can cause temporary and localized increases in air emissions. There will be no  
29 long-term significant increases in air emissions, as the trail beddown is not indefinite.

30

1 Additionally, the action would occur within an area that is in attainment with all NAAQs; therefore, the  
2 proposed action is not subject to General Conformity Regulations and a General Conformity Applicability  
3 Analysis is not required. The proposed action will fall within the base boundaries which is designated as  
4 attainment; therefore, General Conformity does not apply.

5  
6 An air quality impact assessment was conducted in accordance with the guidance in the Air Force Air  
7 Quality EIAP Guide and 32 CFR Part 989. Under the USAF guidance, a Net Change Emissions  
8 Assessment was performed which compared all net (increases and decreases caused by the federal  
9 action) direct and indirect emissions against general conformity de minimis values as indicators of air  
10 quality impact significance. While the proposed action will not be occurring within a nonattainment or  
11 maintenance area, the General Conformity de minimis (i.e., too trivial or minor to merit consideration)  
12 values (40 CFR 93.153) were used as a conservative indicators of potential air quality significance. If  
13 these values represent de minimis emissions levels for nonattainment or maintenance areas; logically  
14 they would also represent emissions levels too trivial or minor to merit consideration in an attainment  
15 area. Therefore, any net emissions below these significance indicators are consider too insignificant to  
16 pose a potential impact on air quality.

17  
18 The Net Change Analysis was performed using the USAF' Air Conformity Applicability Model (ACAM) for  
19 criteria pollutant (or their precursors) and GHGs. The results of the ACAM assessment are summarized  
20 in **Table 4-11**, **Table 4-12**, and **Table 4-13** (see Appendix C for details). All estimated total annual  
21 emissions are below the significance indicators; therefore, the emissions associated with the proposed  
22 actions are too insignificant to pose a potential impact on air quality. There were three emission  
23 scenarios analyzed for this Action; High, Medium and Low (Tables 4-15, 4-16 and 4-17 respectively).  
24 The high emission scenario utilized the F-15 aircraft as a viable surrogate for the MiG-29, the medium  
25 utilized the F-16 as a surrogate for the Mirage aircraft, and the low emission scenario utilized the F-5  
26 aircraft. For air quality in attainment areas, Ozone is the primary concern as the EPA regularly prepares  
27 more stringent NAAQS for ozone. Ozone precursors for Ozone are Nitrogen Oxides (NOx) and Volatile  
28 organic Compounds (VOCs). Aircraft primarily emit NOx, and thus this is the pollutant of highest concern  
29 relating the air quality in attainment areas.

30  
31  
32 **Table 4-11. Net Change Analysis Results - High Emission Scenario**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	10.545	100	No
NOx	<b>56.214</b>	<b>100</b>	<b>No</b>
CO	89.499	100	No
SOx	4.769	100	No
PM 10	8.046	100	No
PM 2.5	7.329	100	No
Pb	0.000	25	No
NH3	0.013	100	No
CO2e	11419.0		

**Table 4-12. Net Change Analysis Results - Medium Emission Scenario**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.411	100	No
NOx	<b>32.714</b>	<b>100</b>	<b>No</b>
CO	45.236	100	No
SOx	3.109	100	No
PM 10	4.601	100	No
PM 2.5	3.068	100	No
Pb	0.000	25	No
NH3	0.013	100	No
CO2e	7609.4		

**Table 4-13. Net Change Analysis Results - Low Emission Scenario**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	30.050	100	No
NOx	<b>14.653</b>	<b>100</b>	<b>No</b>
CO	158.509	100	Yes
SOx	2.263	100	No
PM 10	1.273	100	No
PM 2.5	1.234	100	No
Pb	0.000	25	No
NH3	0.013	100	No
CO2e	4925.4		

The tables above represent the worst annual emissions as a result of this Action. All scenarios show all criteria pollutants below the Significance Indicators, except the low emissions scenario which exceeds for Carbon Monoxide (CO). As previously mentioned, the pollutant of concern for attainment areas is NOx, and therefore the emissions scenario ranking is based off this NOx and does not take the other pollutant totals into account. While low the scenario does exceed the significance indicator for CO, CO is not a pollutant of great concern. The vast majority of the country has continuously reduced the amount of CO in the atmosphere. Furthermore, the increase as a result of this Action is temporary and thus will not cause a significant deterioration of air quality in the affected region in the long term.

Under the Proposed Action, the Tyndall C and E MOAs, Eglin E MOA, W-151 and W-470 would include contract ADAIR sorties at or below 3,000 ft and thus are included in the air quality analysis. Consistent with the USEPA recommendation regarding mixing height, only those emissions that would occur with the mixing layer (lowest 3,000 ft) were analyzed. Out of the of the proposed sorties, 82 are in the Tyndall C and E MOAs, 1,080 are expected to include some time at or below 3,000 ft above sea level in the Eglin E MOA, 1,080 in W-151 and 2,396 were analyzed in W-470. Defensive countermeasures (chaff and flares) are authorized for use below 3,000 ft in the Warning Areas and Eglin E MOA.

The emissions associated with contract ADAIR sorties proposed for the special use airspace were evaluated using ACAM for the High, Medium, and Low Scenarios described previously. The flight time in the mixing layer was estimated to be approximately 7.72 minutes per sortie. In addition, it was assumed the time it would take to fly from Tyndall AFB to and from the airspace would occur at an altitude above 3,000 ft; thus, this portion of the sortie is not included in the analysis. The methodologies, emission factors,

1 and assumptions used for the emission estimates for each of the scenarios are outlined in **Appendix C**.  
2 Emissions were estimated for a 10-year project period beginning in July 2019 and ending in June 2029.  
3 Although this period may not represent the final start and end dates, the annual emissions shown determined  
4 will be representative for any project year.

5  
6 Because the special use airspace is within and border an attainment area for all criteria pollutants the  
7 general conformity rule does not apply; however, the rule's 100 tpy *de minimis* threshold was applied as a  
8 significance indicator. The Low Emission Scenarios are not necessarily lower for all pollutants. Because of  
9 its role in ozone formation NO<sub>x</sub> is the primary pollutant of concern in many areas and thus the Low Emission  
10 Scenarios reflect lower emission rates for NO<sub>x</sub>; however, the lower NO<sub>x</sub> emissions are often at the expense  
11 of other pollutants such as higher CO. Other factors such as the number of engines, fuel flow rates, and  
12 power mode can cause variations that may result in a Low Emission Scenario having higher emissions for  
13 some pollutants when compared to an engine with higher emission factors (pounds pollutant/1,000 pounds  
14 fuel burned).

15  
16 For defensive countermeasures, only the emission from flares were evaluated. The air quality impacts of  
17 chaff were studied by the Air Force and reported in *Environmental Effects of Self-Protection Chaff and*  
18 *Flares* (Air Force, 1997). That study determined that chaff material maintains its integrity after ejection and  
19 that the use of explosive charge in impulse cartridges results in minimal PM<sub>10</sub>. As a result, it was concluded  
20 that the deployment of chaff would not contribute to an exceedance of the NAAQS; therefore, chaff  
21 deployment was not included in the air quality assessment. Emission from M206 Countermeasure Flares  
22 were estimated using Emission Factors for AP-42 Section 15.8 (USEPA, 2009). Only flares expected to be  
23 deployed at or below 3,000 ft in Warning Areas W-151 and W-470 and the Eglin E MOA were included in  
24 the analysis. The quantity of flare to be deployed (baseline use minus estimated future use) at or below  
25 3,000 ft was proportioned based on the percent of total time spent at or below 3,000 ft.

26  
27 **Table 4-14** shows the projected emissions for aircraft use in the Eglin E MOA and Warning Areas W-151  
28 and W-470. The highest emission rate in the Warning Areas is modeled to be 79.5 tpy for NO<sub>x</sub> in W-470.  
29 This action was originally proposed to conduct 2,396 sorties per year in W-470 and the air quality analysis  
30 was based on that number. That proposed action was modified from 2,396 sorties per year to 341 sorties  
31 per year, meaning the emissions for W-470 would actually be one-seventh of the quantities depicted in  
32 **Table 4-14**. The emission rates in W-470 for the higher sortie numbers are already below the conformity  
33 *de minimis* threshold and other metrics that can be used as indicators for significance, the emissions for  
34 one-seventh of those sorties have no potential for significance. Only a small portion of these emissions are  
35 expected to occur within the state jurisdictional boundary. The part of the Warning Areas within the state  
36 jurisdictional boundary is roughly 6 percent of the total Warning Areas. Scaling down the Warning Areas  
37 emissions to account for this would result in emissions of less than 10 tpy for all criteria pollutants. As a  
38 result of this, and the fact that the total emissions would be dispersed over a wide area, no impacts with  
39 respect to the NAAQS and air quality in general are expected.

**Table 4-14. Contract Adversary Air Emissions – Eglin E Military Operations Area and Warning Areas W-151 and W-470**

Airspace	Scenario	Contract (Years) <sup>1</sup>	Emissions (tpy) <sup>2,3</sup>								
			VOC	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	Pb	NH <sub>3</sub>	CO <sub>2e</sub>
Eglin E	High	2019 (July - December)	0.09	16.4	0.44	0.64	0.44	0.39	0.0	0.0	1,960
		2020 through 2028	0.17	32.8	0.87	1.29	0.87	0.79	0.0	0.0	3,921
		2029 (January - June)	0.09	16.4	0.44	0.64	0.44	0.39	0.0	0.0	1,960
	Med	2019 (July - December)	0.15	5.22	2.02	0.39	0.20	0.13	0.0	0.0	1,181
		2020 through 2028	0.29	10.4	4.04	0.77	0.40	0.26	0.0	0.0	2,362
		2029 (January - June)	0.15	5.22	2.02	0.39	0.20	0.13	0.0	0.0	1,181
	Low	2019 (July - December)	0.71	0.40	7.54	0.19	0.00	0.00	0.0	0.0	567
		2020 through 2028	1.41	0.81	15.1	0.37	0.00	0.00	0.0	0.0	1,134
		2029 (January - June)	0.71	0.40	7.54	0.19	0.00	0.00	0.0	0.0	567
W-151 <sup>3</sup>	High	2019 (July - December)	0.09	16.4	0.44	0.64	0.44	0.39	0.0	0.0	1,960
		2020 through 2028	0.17	32.8	0.87	1.29	0.87	0.79	0.0	0.0	3,921
		2029 (January - June)	0.09	16.4	0.44	0.64	0.44	0.39	0.0	0.0	1,960
	Med	2019 (July - December)	0.15	5.22	2.02	0.39	0.20	0.13	0.0	0.0	1,181
		2020 through 2028	0.29	10.4	4.04	0.77	0.40	0.26	0.0	0.0	2,362
		2029 (January - June)	0.15	5.22	2.02	0.39	0.20	0.13	0.0	0.0	1,181
	Low	2019 (July - December)	0.71	0.40	7.54	0.19	0.00	0.00	0.0	0.0	567
		2020 through 2028	1.41	0.81	15.1	0.37	0.00	0.00	0.0	0.0	1,134
		2029 (January - June)	0.71	0.40	7.54	0.19	0.00	0.00	0.0	0.0	567
W-470 <sup>4</sup>	High	2019 (July - Dec)	0.208	39.7	1.06	1.55	1.06	0.95	0	0	4,743
		2020 through 2028	0.416	79.5	2.11	3.11	2.11	1.90	0	0	9,485
		2029 (January - June)	0.208	39.7	1.06	1.55	1.06	0.95	0	0	4,743
	Med	2019 (July - Dec)	0.316	12.5	4.59	0.91	0.478	0.308	0	0	2,785
		2020 through 2028	0.632	25.1	9.17	1.82	0.956	0.616	0	0	5,570
		2029 (January - June)	0.316	12.5	4.59	0.910	0.478	0.308	0	0	2,785
	Low	2019 (July - Dec)	1.71	0.98	18.2	0.45	0.005	0.004	0	0	1,371
		2020 through 2028	3.41	1.95	36.5	0.90	0.009	0.008	0	0	2,743
		2029 (January - June)	1.71	0.98	18.2	0.45	0.005	0.004	0	0	1,371

Source: Air Conformity Applicability Model output

Notes:

<sup>1</sup> While contract ADAIR targeted performance is estimated to start in February 2020 with a 10-year contract, the emissions were estimated for each year of the Proposed Action beginning in July 2019 and ending in June 2029. For air quality modeling purposes, these are representative years; the modeling generates air emissions estimates for the life of a representative 10-year contract.

<sup>2</sup> Represents total per year emissions.

<sup>3</sup> Emission based on 1,080 sorties (45 percent of 2,400 on airfield sorties).

<sup>4</sup> Emission based on 2,396 sorties

NO<sub>x</sub> = nitrogen oxides; CO = carbon monoxide; CO<sub>2e</sub> = carbon dioxide equivalent; NH<sub>3</sub> = ammonia; Pb = lead; PM<sub>2.5</sub> = particulate matter less than 2.5 microns; PM<sub>10</sub> = particulate matter less than 10 microns; SO<sub>x</sub> = sulfur oxides; VOC = volatile organic compound

### 4.4.3 No Action Alternative

The No Action Alternative would not generate any new emissions and are not expected to change emissions from current baseline levels presented in **Section 3.4**. As a result, there would be no change to regional air quality.

1 **4.4.4 Climate Change Considerations**

2  
3 Like many locations, climate trends in the Florida Panhandle appear to be reflecting the influence of global  
4 warming. The sea level is predicted to rise up to 26 inches by 2100 (NASA, 2018). This would have negative  
5 effects on the marine wildlife and coral reef off the coast of Florida and economic effects on waterfront property  
6 and communities. The warmer waters and sea level rise would create an increase in salinity levels around the  
7 panhandle that will affect established fish populations (FWC, 2009). In addition, sea level rises in Florida  
8 threaten to contaminate underwater freshwater aquifers that many residents in Florida depend on.

9  
10 While research is ongoing to understand the connection between climate and the formation of intense  
11 hurricanes, the risk to low-lying and oceanfront areas, and the catastrophic impacts of storm surge from  
12 hurricanes as a result of sea level rise are well documented. According to a 2013 study published in the  
13 Proceedings of the National Academy of Sciences, the risk of a Hurricane Katrina-level storm surge has  
14 risen two to seven times for every 1.8°F increase in temperature (Grinsted, 2013). In addition, a warming  
15 planet means the atmosphere can hold more moisture resulting in more extreme rainfall events such as  
16 observed with Hurricanes Harvey and Florence.

17  
18 To serve as a reference point, projected GHG emissions were compared against State of Florida GHG  
19 emissions from fossil fuel combustion, and to the Title V and PSD major source thresholds for CO<sub>2</sub>e  
20 applicable to stationary sources (**Table 4-15**). Based on the relative magnitude of the project's GHG  
21 emissions, a general inference can be drawn regarding whether the Proposed Action is meaningful with  
22 respect to the discussion regarding climate change.

23  
24 **Table 4-15** demonstrates, GHG emissions for all three emission scenarios would be well below regulatory  
25 thresholds for stationary source permitting and would account for about 0.009 percent of the Florida GHG  
26 emissions that are the result fossil fuel combustion. Based on this analysis, the GHG emissions from the  
27 ADAIR program are not considered significant.

28  
29  
30  
31 **Table 4-15. Metrics for Greenhouse Gas Emission Impacts**

Emission Scenario	Contract ADAIR Projected CO <sub>2</sub> e Emissions (tpy) <sup>1, 2</sup>	CO <sub>2</sub> e Regulatory Thresholds (tpy)		Florida 2016 GHG Inventory (million metric tons/yr) <sup>3, 4</sup>	ADAIR % of Florida GHG Emissions <sup>5</sup>
		Title V Permit	PSD New/Modified Source		
High	22,513	100,000	100,000/ 75,000	230.1	0.009
Medium	13,787				
Low	8,066				

32 Notes:

33 <sup>1</sup> CO<sub>2</sub>e = carbon dioxide equivalent from Air Conformity Applicability Model

34 <sup>2</sup> Sum of highest emissions from airfield operations and MOA and Warning Area sorties

35 <sup>3</sup> Represents metric tons of CO<sub>2</sub> from fossil fuel combustion for residential, commercial, industrial, transportation, and  
36 electric power sectors

37 <sup>4</sup> Source: USEPA, 2018b

38 <sup>5</sup> Percentage based on worst case (high) emission scenario

39 ADAIR = adversary air; GHG = greenhouse gas; PSD = Prevention of Significant Deterioration; tpy = ton(s) per year

40  
41  
42 **4.5 BIOLOGICAL RESOURCES**

43  
44 **4.5.1 Evaluation Criteria**

45  
46 The level of impact on biological resources is based on the

- 47 • importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;

- 1       • proportion of the resource that would be affected relative to its occurrence in the region;
- 2       • sensitivity of the resource to the proposed activities; and
- 3       • duration of potential ecological ramifications.

4  
5 The impacts on biological resources are adverse if species or habitats of high concern (i.e., federally and  
6 state listed threatened and endangered species, marine mammals, designated critical habitat, and  
7 Essential Fish Habitat) are negatively affected over relatively large areas. Impacts are also considered  
8 adverse if disturbances cause reductions in population size or distribution of a species of high concern.  
9

10 As a requirement under the ESA, federal agencies must provide documentation that ensures that agency  
11 actions do not adversely affect the existence of any threatened or endangered species. The ESA requires  
12 that all federal agencies avoid unauthorized “take” of federally threatened or endangered species or  
13 adverse modification of designated critical habitat. Take is defined as an action: to harass, harm, pursue,  
14 hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.  
15

#### 16 4.5.2       *Proposed Action*

17  
18 Under the Proposed Action, there would be no ground-disturbing activities and all potential impacts on  
19 biological resources would be associated with aircraft operations at Tyndall AFB and in the MOAs, ATCAAs,  
20 and Warning Areas W-151 and W-470. The aircraft operations associated with the Proposed Action could  
21 have impacts on biological resources from aircraft movement, the use of defensive countermeasures, noise,  
22 or BASH.  
23

24 Chaff and flares proposed for annual use during training operations could impact biological resources from  
25 the deposition of residual materials, such as plastic, from chaff and flare use, its accumulation in sensitive  
26 areas, and the ultimate breakdown of these materials into substrate mediums. Indirect impacts include  
27 transportation of these materials to other areas by environmental elements and the potential for ingestion  
28 by sensitive marine species within Warning Areas W-151 and W-470. Depending on the altitude of release  
29 and wind speed and direction, the chaff from a single bundle can be spread over distances ranging from  
30 less than a 0.25 mi to over 100 mi (Air Force, 1997). The most confined distribution would be from a low-  
31 altitude release in calm conditions (Air Force, 1997).  
32

33 Chaff chemical composition, rate of decomposition, and tendency to leach toxic chemicals under various  
34 situations paired with baseline substrate chemistry and conditions are factors that could potentially alter  
35 substrate chemistry. A change in chemistry could potentially affect fauna, flora, vegetative cover, substrate  
36 stability, the type and quality of habitat, and leaching and runoff potential. Silica (silicon dioxide), aluminum,  
37 and stearic acid are major components of chaff with minor quantities of copper, manganese, titanium,  
38 vanadium, and zinc in the aluminum chaff coating. All are generally prevalent in the environment, and all  
39 but titanium are either found in plants and animals and/or necessary essentials for their growth. Silica does  
40 not present a concern to chemistry as it is found in silicate minerals, the most common mineral group on  
41 Earth. Silica is more stable in acidic environments than alkaline; however, Gulf of Mexico waters, where the  
42 majority of defensive countermeasures would be used during contract ADAIR training, are slightly more  
43 alkaline than neutral (USEPA, 2019b). Aluminum is also very abundant in the earth’s crust, forming common  
44 minerals like feldspars, micas, and clays. While acidic and extremely alkaline substrates increase the  
45 solubility of aluminum, what is left eventually oxidizes to aluminum oxide which is insoluble. Stearic acid is  
46 used in conjunction with palmitic acid to produce an anti-clumping compound for chaff fibers and both  
47 degrade when exposed to light and air (Air Force, 1997).  
48

49 The primary material in flares is magnesium, which is not highly toxic, and it is highly unlikely organisms  
50 would ingest flare materials; however, plastic caps are released with the deployment of both chaff and flares  
51 and, although highly unlikely, could be ingested. Some flares utilize impulse cartridges and initiators which  
52 contain chromium and sometimes lead. Even though these are hazardous air pollutants under the CAA, a  
53 screening health risk assessment concluded that they do not present a significant health risk (Air Force,  
54 1997). The amount of lead is expected to be very small and dispersed over great distances, and the use of  
55 BMPs would avoid the selection of flares containing lead. More significantly, flares have a potential to start

1 fires that can spread, adversely and indirectly affecting many resources. Flare-induced fires depend on the  
2 probabilities of flare material reaching the ground, igniting vegetation, and causing significant damage if the  
3 fire spreads (Air Force, 1997). Flare use in the MOAs and ATCAAs are subject to altitude and seasonal  
4 restrictions based on specific location and the fire danger level.

5  
6 The following BMPs would be implemented as appropriate:

- 7 • Comply with Air Force and local procedures.
- 8 • Establish a capability to analyze fire risks on a site-specific basis. The methodologies presented  
9 in this report provide a mechanism for accomplishing this.
- 10 • Replace impulse cartridges and initiators in future procurements of flares with models that do not  
11 contain toxic air pollutants such as chromium and lead.
- 12 • Consider a public information program in areas where flares are used over non-DOD land to  
13 educate the public about the hazards of dud flares and proper procedures to follow if a dud  
14 flare is found.

#### 15 16 4.5.2.1 Vegetation

17  
18 Under the Proposed Action, there would be no ground-disturbing activities and as such no potential to  
19 disturb vegetation or habitats on Tyndall AFB, or in the MOAs, ATCAAs, and Warning Areas W-151 and  
20 W-470; therefore, there would be no impacts on vegetation under the Proposed Action.

#### 21 22 4.5.2.2 Wildlife

23  
24 There is limited suitable habitat for wildlife on developed areas of Tyndall AFB and immediately adjacent to  
25 the airfield where contract ADAIR takeoffs and landings would occur; however, undeveloped areas along  
26 the Gulf of Mexico and the bay and sound shorelines support relatively common wildlife species associated  
27 with estuarine and nearshore environments. Most of the forested areas on and immediately adjacent to  
28 Tyndall AFB were decimated by Hurricane Michael with catastrophic damage reported to mature forests in  
29 Bay, Calhoun, and Gulf Counties, Florida (Florida Forest Service, 2018). Wildlife dependent upon mature  
30 trees and relatively open forest understory are now limited in distribution on Tyndall AFB and in nearby  
31 areas within the noise contours. Hurricane Michael caused extensive shoreline erosion, erosion to dunes,  
32 and a lowering of beach profiles east of Panama City Beach, but these habitats typically recover more  
33 quickly than mature loblolly and longleaf pine forests, although dune erosion could take a decade or more  
34 for recovery even with dune restoration efforts (FDEP, 2019).

35  
36 Wildlife, and especially avian species, utilizing bayshore/nearshore and beach and dune habitats for  
37 foraging and breeding would normally be sensitive to increased noise impacts from military aircraft.  
38 Although there is variability in responses across species, many birds and wildlife have the ability to  
39 habituate to noise and movement from military aircraft (Grubb et al., 2010) and military aircraft operations  
40 have been ongoing at Tyndall AFB for decades. Under the High Noise Scenario, the area under the 65-dBA  
41 DNL contour along Gulf of Mexico beaches on and adjacent to Tyndall AFB where numerous shorebirds  
42 forage would not change substantially and the 70-dBA DNL contour would not encroach upon the beaches  
43 or on the bay or sound shorelines. As such, the noise and movement from increased contract ADAIR aircraft  
44 operations is anticipated to have potential negligible, short- and long-term impacts on wildlife, including  
45 birds breeding and foraging in nearby relatively undisturbed habitats.

46  
47 Aircraft operations always have the potential for bird and other wildlife strikes. This can occur during takeoff  
48 and landing on and near active runways, as well as during flight at altitude. With an increase in air operations  
49 associated with contract ADAIR aircraft at Tyndall AFB, there is an increased risk of BASH; however,  
50 Tyndall AFB maintains a BASH prevention program specifically to manage BASH risk and implement  
51 measures to greatly reduce the likelihood for BASH incidents. Further, under the Proposed Action, the  
52 number of operations at Tyndall AFB would decrease compared to the pre-hurricane baseline, reducing the  
53 potential for BASH incidents. The outcome of the BASH program is both increased safety for pilots and  
54 military aircraft as well as less incidents of injury or death to birds and other wildlife. As such, with the  
55 continued airfield management and risk reduction implementation measures associated with the BASH

1 program, the potential impacts on birds and other wildlife from contract ADAIR aircraft strikes during air  
2 operations at Tyndall AFB are minor as discussed in **Section 4.3.2**.

3  
4 Although contract ADAIR aircraft training can operate as low as the sea level surface in Warning Areas  
5 W-151 and W-470 and the Eglin E MOA, the majority of contract ADAIR aircraft training operations would  
6 occur at altitudes above where most bird species would be migrating or foraging. As such, it is highly unlikely  
7 that aircraft movement would adversely impact foraging or migrating birds or have a risk of BASH. Migrating  
8 birds could have a greater potential of encountering contract ADAIR aircraft during training operations,  
9 especially those that migrate at altitudes above 2,000 ft; however, given the large area where training would  
10 occur, that all contract ADAIR training would occur during daytime hours while most songbirds migrate at  
11 night, and that most migratory birds migrate at altitudes less than 2,000 ft, the likelihood for birds to  
12 encounter aircraft during training operations is low; therefore, potential direct, adverse impacts on birds  
13 from aircraft movement is negligible. The number of training operations would decrease in W-151 and W-  
14 470 under the Proposed Action relative to baseline conditions, reducing the potential interactions between  
15 aircraft and birds. Further, given the altitudes at which the majority of training occurs in the special use  
16 airspace, and a reduction in the number of operations in W-151 and W-470, aircraft movement in the Eglin  
17 E MOA and Warning Areas W-151 and W-470 would have no impacts on marine mammals or sea turtles.

18  
19 Noise modeling for the contract ADAIR aircraft training operations (see **Section 4.2.2**) indicates that there  
20 would be no change in noise impacts within the special use airspace, and that subsonic and/or supersonic  
21 noise levels in the airspace would only experience negligible increases. Further, there is substantial  
22 attenuation of noise energy provided by the air/water interface. The negligible change to the noise  
23 environment as a result of contract ADAIR training would have no impact on terrestrial or marine wildlife in  
24 the MOAs and Warning Areas W-151 and W-470.

25  
26 Sonic booms from supersonic flights within the Warning Areas could cause startle effects on avian and  
27 mammal species at or near sea level; however, the sonic boom and postboom rumbling sounds that would  
28 be experienced by wildlife do not differ substantially from thunder. A decrease in operations would occur in  
29 Warning Areas W-151 and W-470 under the Proposed Action with the departure of the F-22 FTU and T-  
30 38s reducing supersonic flight operations. Further, the sonic boom events would be highly isolated and rare  
31 occurrences in Warning Areas W-151 and W-470, there is substantial attenuation of energy from sonic  
32 booms provided by the air/water interface, and sonic booms would occur in areas where supersonic flights  
33 currently occur with military training activities. As such, sonic booms from supersonic flights would have no  
34 impact on wildlife, including marine mammals and sea turtles in the Warning Areas.

35  
36 Under the Proposed Action, the use of chaff and flares would increase on average by 13 percent within the  
37 special use airspace. Of the total proposed use of chaff and flares, the largest increase in use would occur  
38 in the Eglin E and Rose Hill MOAs (25 percent increase) while Warning Areas W-151 and W-470 would  
39 have a 12 percent increase. Potential impacts on avian species from the use of chaff and flares would be  
40 limited to a startle effect from chaff and flare deployment, inhalation of chaff fibers or flare combustion  
41 products, and possible ingestion of residual plastic caps after discharge. The potential of being struck by  
42 debris, or by a dud flare, given the small increase in chaff and flare use in such a large area over Eglin E  
43 and Rose Hill MOAs and Gulf of Mexico, is remote. Startle effects from the release of chaff and flares would  
44 potentially be minimal relative to the noise of the aircraft. The potential for avian species, terrestrial  
45 mammals, marine mammals, or sea turtles to be startled from flare deployment at night when flares would  
46 be most visible would be minimal due to the short burn time of the flare and the very small number of night  
47 training flights that are proposed. It is highly unlikely that during active military training with contract ADAIR  
48 aircraft that birds would remain in the area where training is occurring to be adversely impacted by chaff  
49 and flares deployment. Further, chaff and flares are so small in size, that it is highly unlikely that a small  
50 amount of lightweight material ejected during their deployment would have an adverse impact on birds or  
51 that the material would reach the Gulf of Mexico surface. Lastly, an evaluation of the potential for chaff to  
52 be inhaled by humans and large wildlife found that the fibers are too large to be inhaled into the lungs and  
53 that chaff material is made of silicon and aluminum that has been shown to have low toxicity (Air Force,  
54 1997); therefore, the use of chaff and flares during contract ADAIR training would have a potential negligible  
55 impact on birds.

1 Small residual plastic components of chaff and flares such as end caps and pistons however would be  
2 deposited on the Gulf of Mexico surface during training activities. Although it is highly unlikely due to low  
3 probability of bird species encountering residual plastic components in the very large Warning Areas where  
4 they would be used, some large foraging bird species as well as marine mammals and sea turtles could  
5 ingest the remaining plastic components of chaff and flares if these components remain on the Gulf of  
6 Mexico surface or in the water column. The effect of chaff and flare components on federally listed bird  
7 species, marine mammals, and sea turtles is discussed under the threatened and endangered species  
8 section below.  
9

#### 10 4.5.2.3 Fish

11  
12 Contract ADAIR aircraft operations in the Eglin E MOA and Warning Areas would have no impact on  
13 anadromous and marine fish. The increased use of chaff and flares does increase the potential for plastics  
14 associated with chaff and flares to end up in aquatic ecosystems and in the Gulf of Mexico; however, the  
15 amount of plastic material expended in the use of chaff and flares is small (estimated to be one chaff bundle  
16 or flare for every 5.4 mi<sup>2</sup> of Warning Areas W-151 and W-470 annually), the size of the plastic material is  
17 also very small, and most of the material would fall to the Gulf floor at depths below which most fish species  
18 forage; however, the use of chaff and flares would have a potential minor, adverse impact on fish species  
19 that are large enough to ingest plastic pieces that fall to the Gulf floor on the portion of the continental shelf  
20 that overlaps the boundaries of the Warning Areas, even though the likelihood of any large fish species  
21 encountering plastic caps from chaff and flares is extremely low. The contract ADAIR sorties in the special  
22 use airspace, including the use of defensive countermeasures, would have no impact on Essential Fish  
23 Habitat.  
24

#### 25 4.5.2.4 Invasive Species

26  
27 There are no activities associated with the Proposed Action that have the potential to affect invasive  
28 species. There would be no ground-disturbing activities that have the potential to spread or remove invasive  
29 plants. Similarly, aircraft operations on the airfield or in Warning Areas W-151 and W-470 would have no  
30 impact on invasive plants or wildlife.  
31

#### 32 4.5.2.5 Threatened and Endangered Species

33  
34 Under the Proposed Action, there would be no ground-disturbing activities, and all potential impacts on  
35 biological resources would be associated with aircraft operations in the project area. Because there would  
36 be no ground-disturbing activities, there would be no impacts on federally or state listed plant species,  
37 reptiles, amphibians, fish, or invertebrates.  
38

39 Effects on listed bird and mammal species could occur from flight operations associated with contract  
40 ADAIR training. These aircraft operations could affect biological resources from aircraft movement, noise,  
41 bird and animal aircraft strikes, and use of defensive countermeasures. For listed bird species, given the  
42 large area and high altitude where the majority of contract ADAIR training would occur, and that ADAIR  
43 training would occur during daytime hours, the likelihood for birds to encounter aircraft during training  
44 operations is low. Because contract ADAIR would fly only 232 annual sorties in the Rose Hill MOA and all  
45 of the training operations would be at altitudes above 8,000 ft, these training operations in the Rose Hill  
46 MOA would not adversely affect listed bird species such as the wood stork, or the gray bat. Lower altitude  
47 flights are proposed in the Eglin E MOA and Warning Areas W-151 and W-470; however, there would be  
48 no night flights when most songbirds migrate and the 2,113 annual contracted sorties would be a small  
49 percentage of the overall training operations that currently occur in these special use airspaces where avian  
50 species are habituated to aircraft movement.  
51

52 Contract ADAIR takeoffs and landings at Tyndall AFB would have no effect on any of the listed avian or  
53 mammal species as the low level aircraft movement and aircraft noise do not occur directly over Eglin AFB  
54 Gulf of Mexico beaches where federally and state listed shorebirds such as the American oystercatcher,  
55 piping plover, snowy plover, least tern, and red knot, as well as the Choctawhatchee beach mouse, and

1 St. Andrew beach mouse could occur. Relative to baseline conditions, a reduction in flight operations at  
2 Eglin AFB would occur under the Proposed Action, reducing the likelihood of aircraft movement or noise  
3 adversely affecting listed species near the airfield. Also, no RCW are known to occur adjacent to the airfield  
4 where low altitude takeoffs and landings occur. Aircraft movement at low altitudes during training operations  
5 in the Eglin E MOA could have a startle effect on all listed bird species, including RCW nesting and foraging  
6 in mature pine forests; therefore, low level aircraft movement may affect but is not likely to adversely affect  
7 the RCW, red knot, piping plover, and wood stork in the Eglin E MOA. Further, low level aircraft movement  
8 from contract ADAIR in the Eglin E MOA would have a potential minor, adverse impact on the state listed  
9 American oystercatcher, black skimmer, burrowing owl, Florida sandhill crane, Marian's marsh wren, least  
10 tern, little blue heron, reddish egret, snowy plover, kestrel, and tricolored heron if they were nesting or  
11 foraging on the Eglin Reservation.

12  
13 Additional takeoffs and landings at Tyndall AFB would have no effect on any of the listed avian or mammal  
14 species as the low level aircraft movement and increased noise levels do not occur directly over Tyndall  
15 AFB Gulf of Mexico beaches where the piping plover, snowy plover, least tern, red knot, Choctawhatchee  
16 beach mouse, and St. Andrew beach mouse are known to occur. Also, no RCW are known to occur near  
17 the airfield where low altitude takeoffs and landings occur.

18  
19 It is highly unlikely that either aircraft movement or noise emissions, especially at higher altitudes, would  
20 elicit a response from marine mammals or sea turtles. Noise from contract ADAIR aircraft would not  
21 increase substantially (including from sonic booms) in the Warning Areas where the number of training  
22 operations would decrease relative to the baseline conditions and would therefore have no effect on the  
23 listed marine mammal species and sea turtles. Sonic booms from supersonic aircraft movement could  
24 cause a startle response by the listed species when they are present on the surface of the Gulf of Mexico  
25 at the moment that a sonic boom occurred; however, sonic booms would be relatively rare events during  
26 contract ADAIR training in the action area, and the sonic boom and postboom rumbling would be similar to  
27 what mammal species and sea turtles experience during a thunderstorm, which are frequent occurrences  
28 across the Gulf of Mexico. Further, no substantial change in the noise environment in the Warning Areas is  
29 anticipated under the Proposed Action. Sonic booms from supersonic aircraft movement would therefore  
30 have no effect on listed species.

31  
32 There is the potential for components of chaff and flares that remain after use to fall to the surface of the  
33 Gulf of Mexico where they could be ingested by birds, marine mammals, fish, and sea turtles. Chaff  
34 cartridges, chaff canisters, chaff components, and chaff and flare end caps and pistons would be released  
35 into the marine environment, where they would persist for long periods and could be ingested by marine  
36 wildlife while initially floating on the surface and sinking through the water column. Chaff and flare end caps  
37 and pistons would eventually sink to the seafloor (Spargo, 2007), which would reduce the likelihood of  
38 ingestion by marine wildlife at the surface or in the water column.

39  
40 Bird species could potentially encounter chaff and flare components on the Gulf of Mexico surface while  
41 foraging. Some species of seabirds are known to ingest plastic when it is mistaken for prey (Auman et al.,  
42 1997; Yamashita et al., 2011; Provencher et al., 2014). The ingestion of plastic such as chaff and flare  
43 compression pads or pistons by birds could cause gastrointestinal obstructions or hormonal changes  
44 leading to reproductive issues (Provencher et al., 2014). Unless consumed plastic pieces were regurgitated,  
45 the chaff and flare compression pads or pistons could cause digestive tract blockages and eventual  
46 starvation and be lethal to birds foraging on the Gulf of Mexico surface; however, based on the available  
47 information, it is not possible to accurately estimate actual ingestion rates or responses of individual bird  
48 species (Moser and Lee, 1992); for example, it is possible that these bird species do not mistake these  
49 plastic components for prey and mistakenly consume them. Regardless, the majority of these chaff and  
50 flare plastic components would fall through the water column to the sea floor (Spargo, 2007) and would not  
51 remain on the surface of the Gulf of Mexico where a foraging bird would encounter and consume the plastic  
52 pieces. Further, with the exception of the black skimmer, the listed avian species in the Warning Areas and  
53 Eglin E MOA typically forage along shorelines and beaches and do not forage over the open waters of the  
54 Gulf of Mexico; therefore, the use of chaff and flares over the Gulf of Mexico as a result of the contract  
55 ADAIR training, would have no effect on any listed avian species except for the black skimmer. The black  
56 skimmer's feeding behavior could place them in contact with small plastic components in the Warning Areas

1 or Eglin E MOA from the use of chaff and flares. A potential minor, adverse impact on the state listed black  
2 skimmer could occur from the use of defensive countermeasures as there is the potential for the black  
3 skimmer to encounter a small piece of plastic debris on the Gulf surface during foraging.

4  
5 In the very unlikely event that unconsumed chaff and flare components were encountered and ingested by  
6 a marine mammal, the small size of chaff and flare end-caps and pistons (i.e., 1.3 in. in diameter and  
7 0.13 in. thick) would pass through the digestive tract of marine mammals; therefore, the use of defensive  
8 countermeasures may affect but is not likely to adversely affect marine mammals. Sea turtles could also  
9 ingest the end caps of chaff and flares. It is likely that small residual plastic components of chaff and flares  
10 would also pass through the digestive tract of mature sea turtles. Small plastic components could however  
11 cause digestive problems for smaller sea turtles if ingested, but with the large area that would be utilized  
12 for contract ADAIR training in Warning Areas W-151 and W-470 and a proposed 12 percent annual increase  
13 in the use of chaff and flares in the Warning Areas from the proposed contract ADAIR training, it is highly  
14 unlikely that a sea turtle would encounter chaff and flare components; therefore, the use of chaff and flares  
15 over the Gulf of Mexico as a result of contract ADAIR training may affect but is not likely to adversely affect  
16 sea turtles. Manatees, which are herbivores in nearshore environments do not forage in a way that would  
17 cause them to mistakenly ingest small plastic components as prey; however, manatees could inadvertently  
18 ingest small plastic residual components from chaff and flares that could get lodged in seagrass or other  
19 aquatic plants; therefore, the use of chaff and flares in nearshore environments such as the Eglin E MOA  
20 may affect but is not likely to adversely affect the West Indian manatee.

21  
22 The giant manta ray and oceanic whitetip shark would not be seeking prey that would be similar to plastic  
23 end caps from chaff and flares, nor do they typically feed on the Gulf of Mexico surface or seafloor where  
24 these plastic components would be most prevalent; however, there is still the possibility of an encounter  
25 between these fish species and the chaff and flare residual plastic components; therefore, the use of  
26 defensive countermeasures by contract ADAIR in the Warning Areas may affect but is not likely to adversely  
27 affect the giant manta ray and oceanic whitetip shark. Gulf sturgeon likewise may encounter small residual  
28 plastic components from chaff and flares as these species often feed on the Gulf bottom or the bottom of  
29 estuaries, such as those in the Eglin E MOA; therefore, the use of defensive countermeasures by contract  
30 ADAIR in the Eglin E MOA may affect but is not likely to adversely affect the Gulf sturgeon. The smalltooth  
31 sawfish would not occur in the Eglin E MOA or the deeper waters of Warning Areas W-151 and W-470;  
32 therefore, contract ADAIR would have no effect on the smalltooth sawfish.

33  
34 As previously mentioned, ADAIR training would have no effect on federally or state listed reptiles (with the  
35 exception of sea turtles), amphibians, invertebrates, mollusks, and freshwater fish as all contract ADAIR  
36 training activities in the action area would be limited to aircraft movement and the use of defensive  
37 countermeasures in the Warning Areas. Further, ADAIR training would have no effect on the  
38 Choctawhatchee beach mouse, St. Andrew beach mouse, gray bat, Nassau grouper, and smalltooth  
39 sawfish.

40  
41 The Air Force has made a may affect but not likely to adversely affect determination for the RCW, piping  
42 plover, red knot, wood stork, federally listed marine mammals, federally listed sea turtles, Gulf sturgeon,  
43 giant manta ray, and whitetip oceanic shark. Letters requesting concurrence with this determination have  
44 been sent to the USFWS and NMFS (**Appendix A**).

#### 45 46 **4.5.3**      *No Action Alternative*

47  
48 Under the No Action Alternative, the contract ADAIR operations would not occur at Tyndall AFB, and there  
49 would be no contract ADAIR training operations in the special use airspace. As such, there would be no  
50 impact on biological resources.

1 4.6 CULTURAL RESOURCES  
2

3 4.6.1 *Evaluation Criteria*  
4

5 Adverse impacts on cultural resources might include physically altering, damaging, or destroying all or part  
6 of a resource; altering characteristics of the surrounding environment that contribute to the resource's  
7 significance; introducing visual or audible elements that are out of character with the property or alter its  
8 setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or  
9 lease of the property out of agency ownership (or control) without adequate enforceable restrictions or  
10 conditions to ensure preservation of the property's historic significance. For the purposes of this EA, an  
11 impact is considered major if it alters the integrity of Tyndall AFB or results in the loss of contributing  
12 resources in the historic district or potentially impacts traditional cultural properties.  
13

14 4.6.2 *Proposed Action*  
15

16 The Proposed Action includes elements affecting the base and military training airspace. As described in  
17 **Chapter 2**, the elements affecting the base include contract ADAIR aircraft, facilities, maintenance,  
18 personnel, and sorties. The elements affecting the airspace include airspace use and defensive  
19 countermeasures. Potential impacts resulting from the Proposed Action related to cultural resources are  
20 described below.  
21  
22

23 4.6.2.1 *Traditional Cultural Properties*  
24

25 There are currently ten federally recognized Native American tribes in, and with historic ties to, Florida.  
26 These include the Alabama-Coushatta Tribe of Texas, Choctaw Nation of Oklahoma, Coushatta Tribe of  
27 Louisiana, Miccosukee Tribe of Indians, Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation,  
28 Poarch Band of Creek Indians, Seminole Tribe of Florida, Seminole Nation of Oklahoma, and the  
29 Thlopthlocco Tribal Town. The airspace APE crosses into Alabama so the list of Tribes consulted as part  
30 of this EA was extended to include the Alabama-Quassarte Tribal Town. No known traditional cultural  
31 properties or sacred sites have been identified at Tyndall AFB nor have any been identified as part of  
32 ongoing consultation on the Proposed Action. The Proposed Action would therefore have no effect, and  
33 consequently no impact, on traditional cultural properties or sacred sites.  
34

35 4.6.2.2 *Archaeological Resources*  
36

37 No ground disturbance would take place as part of the Proposed Action; therefore, potential archaeological  
38 deposits would not be impacted. Sorties within the Warning Areas would be performed at an altitude over  
39 the Atlantic Ocean that would not affect potential submerged resources. The Proposed Action would  
40 therefore have no effect, and consequently no impact, on archaeological resources.  
41

42 4.6.3 *No Action Alternative*  
43

44 Under this alternative, no contract ADAIR assets would be established at Tyndall AFB resulting in no  
45 change to cultural resources.  
46

47 4.7 HAZARDOUS MATERIAL AND WASTES, TOXIC SUBSTANCES, AND CONTAMINATED SITES  
48

49 4.7.1 *Evaluation Criteria*  
50

51 Impacts on HAZMAT management would be considered adverse if the federal action resulted in  
52 noncompliance with applicable federal and state regulations, or increased the amounts generated or  
53 procured beyond current Tyndall AFB waste management procedures and capacities. Impacts on the ERP

1 would be considered adverse if the federal action disturbed (or created) contaminated sites resulting in  
2 negative effects on human health or the environment.

#### 3 4 **4.7.2 Proposed Action**

5  
6 Under the Proposed Action, maintenance and operations of 12 contracted ADAIR aircraft could contribute  
7 to the volume of HAZMAT stored and used at Tyndall AFB and the amount of hazardous wastes generated.  
8 Impacts associated with hazardous materials and wastes, contaminated sites, toxic substances are limited  
9 to Tyndall AFB. As discussed previously, an emergency fuel dump could occur in the special use airspace;  
10 however, due to the infrequent nature of fuel dumps as well as in-place safety precautions, these  
11 emergency procedures are not likely to have adverse effects.

#### 12 13 **4.7.3 Hazardous Materials and Wastes**

14  
15  
16 The quantity of HAZMAT such as oil, Jet-A fuel, hydrazine, hydraulic fluid, solvents, sealants, and antifreeze  
17 would increase with the operations and maintenance of contract ADAIR aircraft at Tyndall AFB. HAZMAT  
18 required for the contract ADAIR aircraft and used by contract personnel would be procured, controlled, and  
19 tracked through the EESOH-MIS, following established Tyndall AFB procedures. This would ensure that  
20 only HAZMAT needed for operations and maintenance at the smallest quantities would be used and that  
21 all of the HAZMAT used for contract ADAIR at Tyndall AFB would be properly tracked. The existing  
22 hydrazine storage and servicing facility at Tyndall AFB has the capacity to support the additional contract  
23 ADAIR aircraft.

24  
25 The quantity of hazardous wastes generated would increase as a result of the contract ADAIR operations  
26 at Tyndall AFB; however, all hazardous waste generated as a result of contract ADAIR aircraft operations  
27 and maintenance would be properly handled, stored, and disposed of following the Tyndall AFB Hazardous  
28 Waste Management Plan (Tyndall AFB, 2019). This ensures that hazardous waste is managed according  
29 to all federal, state, and local laws and regulations. As such, there would be no impact from the procurement  
30 and use of HAZMAT or the storage and disposal of hazardous waste.

#### 31 32 **4.7.4 Installation Restoration Program**

33  
34 The locations chosen for contract ADAIR operations and maintenance activities at Tyndall AFB would not  
35 be associated with any active IRP sites. There would be no ground disturbing activities that could spread  
36 existing contamination or expose workers to contamination at IRP sites. No impact is anticipated from the  
37 contract ADAIR operations and maintenance and pilot briefing activities.

#### 38 39 40 **4.7.5 Asbestos-Containing Materials and Lead-Based Paint**

41  
42 If ACM are determined to be present in the portion of a building chosen for contract ADAIR use and slated  
43 for renovation, the ACM would be properly removed and disposed of according to the Tyndall AFB Asbestos  
44 Management and Operations Plan (Tyndall AFB, 2018).

45  
46 LBP could be present in an older building if chosen to support the contract ADAIR personnel. If renovations  
47 would be required to any building at Tyndall AFB chosen for use by contract ADAIR, any potential LBP  
48 would be properly handled and disposed of in accordance with federal, state, and local laws.

49  
50 Building 503 was constructed in 1987 and is not known to have any ACM or LBP. With the implementation  
51 of the requirements described by the Asbestos Management Plan and proper handling of LBP if it was  
52 determined to be present in Building 503, there would be no impact from potential ACM or LBP.

1 4.7.6 *Radon*  
2

3 There is a low potential for radon to pose a health hazard at Tyndall AFB. Further, no new construction is  
4 proposed. As such, no impact from radon is anticipated.  
5  
6

7 4.7.7 *Polychlorinated Biphenyls*  
8

9 Removal of any light fixtures has the potential to disturb PCBs. If renovations of the interior buildings chosen  
10 to support contract ADAIR require the removal of fluorescent lighting fixtures that could contain PCBs, the  
11 lighting fixtures would be disposed of according to federal, state, and local laws. The removal and proper  
12 disposal of light fixtures containing PCBs is a potential long-term, minor, beneficial impact under the  
13 Proposed Action.  
14  
15

16 4.7.8 *No Action Alternative*  
17

18 Under the No Action Alternative, the contract ADAIR operations would not occur at Tyndall AFB. As such,  
19 no increased quantity of HAZMAT would be used and no increased quantity of hazardous wastes would be  
20 generated. No interior renovations of buildings to support contract ADAIR personnel would be required;  
21 therefore, there would be no potential disturbance of ACM, LBP, or PCBs in Tyndall AFB buildings. As a  
22 result, there would be no direct or indirect impact on any HAZMAT or hazardous or special wastes.

1 **CHAPTER 5 CUMULATIVE IMPACTS AND OTHER ENVIRONMENTAL**  
2 **CONSIDERATIONS**  
3

4 This section includes an analysis of the potential cumulative impacts by considering past, present, and  
5 reasonably foreseeable future actions; potential unavoidable adverse impacts; the relationship between short-  
6 term uses of resources and long-term productivity; and irreversible and irretrievable commitment of resources.  
7

8 **5.1 CUMULATIVE EFFECTS**  
9

10 The CEQ regulations stipulate that the cumulative effects analysis considers the potential environmental  
11 consequences resulting from “the incremental impact of the action when added to other past, present, and  
12 reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person  
13 undertakes such other actions” (40 CFR § 1508.7). In addition, CEQ published guidance for addressing  
14 and analyzing cumulative impacts under NEPA. CEQ’s publication, *Considering Cumulative Effects Under*  
15 *the National Environmental Policy Act* (January 1997), provides additional guidance for conducting an  
16 effective and informative cumulative impacts analysis.  
17

18 This section identifies and evaluates past, present, and reasonably foreseeable future projects that could  
19 cumulatively affect environmental resources in conjunction with the Proposed Action. The ROI for the  
20 cumulative effects analysis is the same as defined for each resource in **Chapter 3**. Actions identified in  
21 **Table 5-1** would not interact with all resources; therefore, resources that potentially could result in a  
22 cumulative effect with the addition of the Proposed Action and alternatives are noted in the table.  
23

24 Assessing cumulative effects begins with defining the scope of other actions and their potential  
25 interrelationship with the proposed or alternative actions. Other activities or projects that coincide with the  
26 location and timetable of the Proposed Action and other actions are evaluated. Actions not identified in  
27 **Chapter 2** as part of the proposed or alternative actions, but that could be considered as actions connected  
28 in time or space (40 CFR § 1508.25) may include projects that affect areas on or near Tyndall AFB.  
29

30 An effort has been made to identify actions that are being considered or are in the planning phase at this  
31 time. To the extent that details regarding such actions exist and the actions have a potential to interact with  
32 the Proposed Action or alternatives, these actions are included in this cumulative analysis. This approach  
33 enables decision makers to have the most current information available in order that they can evaluate the  
34 potential environmental consequences of the Proposed Action.  
35

36 **5.2 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS**  
37

38 Past, present, and reasonably foreseeable actions by the Air Force on Tyndall AFB as well as in the region  
39 were considered. A review of the available information from federal, state, and regional agencies indicated  
40 that the region is currently in recovery and rebuilding following the devastation of Hurricane Michael. This  
41 process is expected to be ongoing for several years. Most buildings on Tyndall AFB sustained major  
42 damage, including flightline and support facilities. In addition, operational units have been relocated to other  
43 Air Force bases. These current and foreseeable future activities have the potential to result in a cumulative  
44 effect.  
45

46 **5.2.1 Air Force Actions**  
47

48 In addition to the Hurricane recovery efforts, recent past and ongoing military actions at Tyndall AFB were  
49 considered as part of the baseline or existing condition in the appropriate ROI. Each project summarized in  
50 this section was reviewed to consider the implication of each action with the Proposed Action or No Action  
51 Alternative. Potential overlap in the affected area and project timing were considered.  
52

53 Tyndall AFB is currently in recovery and rebuilding following the devastation of Hurricane Michael. This  
54 process is expected to be ongoing for several years and will return to full operational status as facilities  
55 become available. Under full operational status, Tyndall AFB would continue to be an active military

1 installation that experiences continuous evolution of mission and operational requirements. All construction  
 2 projects must comply with land use controls, which include safety and environmental constraints, which are  
 3 outlined in the ICEMAP (Tyndall AFB, 2015a). Tyndall AFB, like other major military installations, requires  
 4 new construction, infrastructure improvements, and general maintenance. These routine projects are  
 5 environmentally cleared using NEPA’s Categorical Exclusion process and would continue to occur during  
 6 operation of the Proposed Action. In addition to these routine projects, **Table 5-1** lists the past, present,  
 7 and reasonably foreseeable future major Air Force projects anticipated to occur on the base. Anticipated  
 8 future off-base projects that may overlap in the potentially affected area or project timing with the Proposed  
 9 Action were also considered and are discussed in **Sections 5.2.2** and **5.2.3** below.

10  
 11 **Table 5-1. Past, Present, Reasonably Foreseeable Future Projects at Eglin Air Force Base**

<b>Scheduled Project</b>	<b>Project Summary</b>	<b>Implementation Date</b>	<b>Relevance to Proposed Action</b>	<b>Resource Potentially Affected</b>
<b><i>Past Actions</i></b>				
Replacement of QF-4 FSATs with QF-16 FSATs at Tyndall AFB	Project includes replacement of 82 outdated QF-4 FSATs with QF-16 FSATs to achieve full-scale aerial target training.	2014	Replacement occurred in the airspace proposed for contract ADAIR.	Airspace Management and Use
New Combat Arms Range at Tyndall AFB, Florida	Project includes construction of a new fully contained indoor combat arms range to support training in the use of small arms under the Combat Arms Training and Maintenance program.	2018	Construction coincides with rebuilding efforts following Hurricane Michael and potentially ADAIR implementation.	Noise, Air Quality, Biological Resources, Socioeconomics – Income and Employment
<b><i>Present Actions</i></b>				
Tyndall AFB Master Plan and associated NEPA	Project includes Master Plan for reconstruction of Tyndall AFB	2019	Planning and construction efforts would be completed prior to proposed ADAIR implementation.	Airspace Management and Use, Noise, Safety, Air Quality, Biological Resources, Socioeconomics – Income and Employment
Special EA for Emergency Beddown of the F-22 Formal Training Unit and Associated T-38 Aircraft from Tyndall AFB to Eglin AFB, Florida	Project includes special environmental review of the temporary beddown of F-22 aircraft and associated T-38 aircraft from Tyndall AFB to Eglin AFB resulting from the Hurricane Michael devastation.	2019	Aircraft temporary were relocated from Tyndall AFB to Eglin AFB.	Airspace Management and Use, Noise

**EA for Tyndall AFB Combat Air Forces Contracted Adversary Air  
Draft**

<b>Future Actions</b>				
F-35A Wing and MQ-9 Wing Environmental Impact Statement – Tyndall AFB	Project includes beddown of an F-35A and/or an MQ-9 Wing. The beddown could bring 4,100 airmen, 72 F-35A and 24 MQ-9 aircraft.	EIS pending. Anticipated to be fully operational in 2023	Project would use same airfield and airspace as proposed for ADAIR operations.	Airspace Management and Use, Air Quality, Noise, Socioeconomics – Income and Employment
Combat Air Forces Adversary Air Eglin AFB Draft EA	Project includes contract ADAIR sorties for Combat Air Forces training at Eglin AFB. Approximately 2,320 contracted sorties would be added to perform training activities within Warning Area W-151, the Rose Hill MOA/ATCAA, and the Eglin E MOA/ATCAA.	2021	Project would be the follow on to this proposed action. It would determine a permanent location for the temporary ADAIR operations at Tyndall AFB.	Airspace Management and Use, Air Quality, Noise
AFSOC Aircraft Basing at Duke Field EA	Project includes growing the 6 <sup>th</sup> Special Operations Squadron at Duke Field, FL. This growth would include 294 additional personnel and five armed Intelligence, Surveillance and Reconnaissance aircraft such as the Cessna 208 Caravan.	2022	Project would use some of the same airspace (R-2419A/R-2519A) as proposed for ADAIR operations at Tyndall AFB.	Airspace Management and Use, Air Quality, Noise

- 1 Notes:
- 2 ADAIR = adversary air; AFB = Air Force Base; ATCAA = Air Traffic Control Assigned Airspace; EIS = Environmental Impact
- 3 Statement; FSATS = Full-Scale Aerial Targets; MOA = Military Operations Area; NEPA = National Environmental Policy Act
- 4
- 5

1 5.2.2 *Nonfederal Actions*  
2

3 Nonfederal actions such as new development or construction projects occurring in the area surrounding  
4 Tyndall AFB were considered for potential cumulative impacts. One past project was considered in addition  
5 to the substantial efforts to rebuild the region after Hurricane Michael. The Florida Department of  
6 Transportation Highway 30 Expansion to reconfigure base traffic from through traffic on State Road 30 and  
7 Airey Avenue was completed in 2016.  
8  
9

10  
11 5.3 CUMULATIVE EFFECTS ANALYSIS  
12

13 The following analysis considers how projects identified in **Table 5-1** could cumulatively result in potential  
14 environmental consequences with the Proposed Action. The development of the Tyndall AFB Master Plan  
15 and associated NEPA that analyzes the effects on the human and natural environment from implementing  
16 that plan are ongoing. When complete, contract ADAIR requirements will be evaluated or supplemental  
17 NEPA analysis would be completed.  
18

19 5.3.1 *Airspace Management and Use*  
20

21 Cumulative impacts on airspace management and use from contract ADAIR operations, in addition to past,  
22 present, and reasonably foreseeable future actions, are expected to be negligible. While the addition of  
23 contract ADAIR sorties would increase Eglin E and Rose Hill MOA use by 19 percent, the departure and  
24 permanent beddown of the F-22 FTU and supporting T-38s would reduce operational sorties by 59 percent  
25 at Eglin AFB (and reduce training operations at W-151) and thus increase airspace capacity. The addition  
26 of contract ADAIR operations would potentially result in a negligible cumulative effect when considered with  
27 past, present, and reasonably foreseeable future projects.  
28

29 5.3.2 *Noise*  
30

31 The Proposed Action, in addition to the majority of past, present, and reasonably foreseeable future actions  
32 at Tyndall AFB, would result in less than significant cumulative noise impacts. Construction and demolition  
33 projects as part of the recovery effort would continue to occur during the same period as the proposed  
34 contract ADAIR implementation at Tyndall AFB. In addition, following recovery, routine construction projects  
35 would take place as part of the installations evolving mission. Since construction noise is localized to the  
36 construction sites and would be short-term, no cumulative long-term noise impacts are anticipated. The  
37 temporary movement of Tyndall AFB aircraft to Eglin AFB has greatly reduced the cumulative noise level  
38 in the vicinity of the Tyndall AFB airfield in the short term. The addition of ADAIR aircraft would slightly  
39 increase the number of supersonic flights in the proposed airspace than what currently exists. Because  
40 there would only be a slight increase in supersonic flights, no major cumulative effect on noise is expected  
41 in the airspace. There are potential additive cumulative noise impacts if the MQ-9 Reaper Wing/F-35A Wing  
42 Beddown were to occur at Tyndall AFB. However, these impacts would not result in significant cumulative  
43 impacts when considering the duration and timing of implementation of the ADAIR proposal. The ADAIR  
44 proposal at Tyndall AFB would occur over 24 months or less, and its timing would not overlap proposed  
45 future operations of the F-35/MQ-9 beddown in such a way that could result in significant noise impacts.  
46

47 5.3.3 *Safety*  
48

49 The Proposed Action, in addition to past, present, and reasonably foreseeable future actions on and off  
50 Tyndall AFB, would follow existing safety procedures and policies for ground and flight operations. Safety  
51 zones would not change under contract ADAIR. Contract personnel would be trained and required to follow  
52 safety procedures in accordance with the Flight Crew Information File and established aircraft flight  
53 manuals. As such, no cumulative impact on ground and flight safety is expected with implementation of the  
54 Proposed Action.  
55

1 5.3.4 *Air Quality*  
2

3 Proposed Action, in addition to past, present, and reasonably foreseeable future actions on and off  
4 Tyndall AFB would result in negligible cumulative impacts to air quality. Since this Action is not a  
5 permanent beddown, the emissions resulting would only be temporary, and given the attainment status of  
6 Tyndall, there would be no significant deterioration of the air quality in the region even taking other  
7 actions into consideration.  
8

9 5.3.5 *Biological Resources*  
10

11 The Proposed Action, in addition to past, present, and reasonably foreseeable future actions on and off  
12 Tyndall AFB, would potentially result in a less than significant cumulative impacts on biological resources.  
13 Since there are no ground-disturbing activities proposed, there could be no cumulative impacts on  
14 vegetation. Potential noise impacts on wildlife using the bayshore/nearshore habitats would result in  
15 negligible impacts under the Proposed Action. There are potential additive cumulative noise impacts if the  
16 MQ-9 Reaper Wing/F-35A Wing Beddown were to occur at Tyndall AFB. However, these impacts would  
17 not result in significant cumulative impacts when considering the duration and timing of implementation of  
18 the ADAIR proposal. The ADAIR proposal at Tyndall AFB would occur over 24 months or less, and its  
19 timing would not overlap proposed future operations of the F-35/MQ-9 beddown in such a way that could  
20 result in significant noise impacts. When added to past, present, and foreseeable future action, the  
21 Proposed Action would result in an increased risk of aircraft bird and other wildlife strikes. Compliance with  
22 the Tyndall AFB BASH prevention program would reduce the potential cumulative risk of contracted sortie  
23 operations associated with aircraft bird and other wildlife conflicts. There would be no cumulative impacts  
24 on marine mammals, sea turtles, or Essential Fish Habitat because the majority of training associated with  
25 the Proposed Action, the Eglin AFB contract ADAIR Proposed Action, and the F-35A and MQ-9 Wing action  
26 in the Warning Areas would be at mid- to high altitudes, interactions between military aircraft training in the  
27 airspace and marine mammals and sea turtles while on the surface of the ocean would be highly unlikely,  
28 and there would be no substantial change in the noise environment. No cumulative effects on federal or  
29 state listed plant species, terrestrial reptiles, amphibians, fish, or invertebrates are anticipated because  
30 there would be no ground-disturbing activities from the Proposed Action. Further, no cumulative impacts  
31 on threatened and endangered species are anticipated. No significant cumulative effects on biological  
32 resources are expected.  
33  
34

35 5.4 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY  
36

37 CEQ regulations (Section 1502.16) specify that analysis must address "...the relationship between short-term  
38 uses of man's environment and the maintenance and enhancement of long-term productivity." Attention  
39 should be given to impacts that narrow the range of beneficial uses of the environment in the long term or  
40 pose a long-term risk to human health or safety. This section evaluates the short-term benefits of the proposed  
41 project compared to the long-term productivity derived from not pursuing the proposed or alternative actions.  
42

43 Short-term effects on the environment are generally defined as a direct or indirect consequence of a project  
44 in its immediate vicinity. For example, direct short-term effects could include localized disruptions from  
45 construction. BMPs in place for each project should reduce potential impacts or disruptions. Under the  
46 Proposed Action, these short-term uses would have a negligible cumulative effect.  
47

48 The Proposed Action involves providing dedicated contract ADAIR sorties to employ adversary tactics  
49 within existing Eglin AFB airspace. There would be no short-term effects on the airspace used by ADAIR  
50 activities and therefore no adverse impact on the long-term productivity and future use of the MOAs and  
51 Warning Areas proposed for ADAIR use. The Proposed Action also includes elements affecting Tyndall  
52 AFB such as ADAIR aircraft, facilities, maintenance, and personnel. Under the Proposed Action and  
53 alternatives, there would be no new construction. Existing installation facilities would be used with some  
54 internal modifications. While other maintenance activities would be occurring in the vicinity of the Proposed  
55 Action facilities, construction associated with these modifications represent a negligible effect on the short-

1 term use of construction labor, goods, and services. No negative effects are expected from the Proposed  
2 Action short-term use or long-term productivity.

3  
4 **5.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

5  
6 Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and  
7 the effects that the uses of these resources have on future generations. Irreversible effects result primarily  
8 from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within  
9 a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected  
10 resource that cannot be restored as a result of the action.

11  
12 The Proposed Action would use existing airspace to conduct ADAIR activities and is not expected to result in  
13 a significant irreversible and irretrievable commitment of airspace or fuel resources. The addition of ADAIR  
14 sorties and personnel to support the Proposed Action would create additional fuel consumption from daily  
15 commutes to and from Tyndall AFB. Consumption of fuel associated with the Proposed Action, in addition to  
16 the total use of available fuels, is expected to result in a negligible decrease to the overall supply of regional  
17 petroleum resources. Additionally, use of training ordnance (chaff and flares) in the proposed ADAIR airspace  
18 would result in a 11 percent increased commitment to chemicals and other ordnance materials; however, this  
19 increase is expected to be a minor demand in relation to the overall supply of chemicals and ordnance  
20 materials. No significant irreversible or irretrievable commitment of resources is anticipated from implementing  
21 the Proposed Action.

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**CHAPTER 6 LIST OF PREPARERS**

The following individuals assisted in the preparation of this Draft EA:

**Dean Alford, PG**  
Vernadero Group, Inc.  
Senior Geologist  
M.S. Geology/Geochemistry  
B.S. Geology  
Years of Experience: 30  
Contribution: Hazardous Materials and Wastes

**Anna Banda**  
Versar, Inc.  
Geoscientist/Copy Editor  
M.S. Geology  
B.S. Geology  
Years of Experience: 11  
Contribution: Editing, Report Production

**Dan Becker, GISP**  
Vernadero Group, Inc.  
Information Technology & Services Director  
M.A. Geography  
B.A. Geography  
Years of Experience: 9  
Contribution: GIS/Cartography

**Brian Bishop**  
Versar, Inc.  
Environmental Scientist  
M.S. Environmental Science  
B.S. Biology  
Years of Experience: 17  
Contribution: Description of the Proposed Action  
and Alternatives Development, Land Use,  
Biological Resources

**Kevin Bradley**  
KBRWyle  
Engineering Manager  
B.S. Aerospace Engineering  
M.S. Aerospace Engineering  
Years of Experience: 23 years  
Contribution: Noise

**Mackenzie Caldwell Rohm**  
Versar, Inc.  
M.A. Anthropology/Archaeology  
B.A. Anthropology/Archaeology/Sociology  
Years of Experience: 16  
Contribution: Cultural Resources

**Rahul Chettri**  
Versar, Inc.  
Senior Air Quality Engineer  
M.S. Environmental Studies  
B.S. Economics  
Years of Experience: 35  
Contribution: Air Quality

**Maggie Fulton**  
Vernadero Group, Inc.  
Technical Editor  
B.A., English  
Years of Experience: 32  
Contribution: Intergovernmental/Interagency  
Coordination for Environmental Planning, Notice  
of Availability

**Chris Hobbs**  
KBRWyle  
Senior Acoustician  
M.S. Physics  
Years of Experience: 20  
Contribution: Noise

**Isaac Jimenez**  
Versar, Inc.  
B.S. Geology  
Years of Experience: 2  
Contribution: Air Quality

**Anicka Kratina-Hathaway**  
Vernadero Group, Inc.  
Biologist  
M.S. Zoology and Physiology  
B.S. Ecology and Organismal Biology  
Years of Experience: 11  
Contribution: Biological Resources

**Radhika Narayanan**  
Versar, Inc.  
M.S. Environmental Science  
B.S. Chemistry  
Years of Experience: 27  
Contribution: Air Quality

**Duane E. Peter, RPA**  
Heritage Consulting  
President  
M.A. Anthropology  
B.A. History  
Years of Experience: 40  
Contribution: Cultural Resources

1 **Thomas Phelan**  
2 KBRWyle  
3 Director, Air Vehicle Operation Unit  
4 B.S. Aeronautical Engineering  
5 M.S. Aeronautical Engineering  
6 Years of experience: 39 (Navy and Contractor)  
7 Contribution: Airspace and Safety

8  
9 **Kristen Reynolds**  
10 Versar, Inc.  
11 M.A. History  
12 B.A. English  
13 Years of Experience: 15  
14 Contribution: Architectural Historian

15  
16 **Peggy Roberts**  
17 Versar, Inc.  
18 Senior NEPA Project Manager  
19 M.S. Organizational Leadership/Project  
20 Management  
21 M.S. Public Communications & Technology  
22 B.A. Journalism/Public Relations  
23 Years of Experience: 25 years  
24 Contribution: Cumulative Impacts, Land Use

25  
26 **Tim Sletten**  
27 Versar, Inc.  
28 Senior Environmental Scientist  
29 B.S. Meteorology  
30 Years of Experience: 33  
31 Contribution: Air Quality  
32

33 **Derek Stadther**  
34 KBRWyle  
35 Acoustical Engineer  
36 MEng. Acoustics  
37 Years of Experience: 6  
38 Contribution: Noise and Airspace

39  
40 **Christa Stumpf**  
41 Versar, Inc.  
42 Program Manager, NEPA Planner  
43 M.S. Forest Resource and Land Use Planning  
44 B.S. Wildland Management  
45 Years of Experience: 23  
46 Contribution: Project Management, QA/QC

47  
48 **Eric Webb**  
49 Vernadero Group, Inc  
50 Vice President and Technical Services Director  
51 Ph.D. Oceanography and Coastal Sciences  
52 M.S. Biology  
53 B.S. Biology  
54 Years of Experience: 23  
55 Contribution: Program Management, Quality  
56 Control, Regulatory Interface, Socioeconomics,  
57 Transportation

1 **Government Contributors**

2  
3 The following individuals contributed to this Draft EA:

4

<b>Contributor</b>	<b>Organization/Affiliation</b>
Crystal Darnell	USACE Mobile
Brian Peck	USACE Mobile
John Doss	AFCEC/CZN
Grace Keesling	AFCEC/CZN
Mike Ackerman	AFCEC/CZN
John Saghera	ACC/A3TO
Josh Hudson	ACC/A3TO
Sarah Amthor	ACC AFIMSC DET 8/IS
George Duda	ACC/A8BA
Donald Mattner	ACC A589/A8BG
Brent Cartagena	ACC/A8BA
Rob Anderson	ACC AMIC/PMSA
Wanda Gooden	ACC AMIC/PMSA
Kevin Stiens	ACC AQC MGMT INTEG CE/DRJ
Major Patrick Milott	ACC AFLOA/JACE-FSC
Tom Bucci	AFLOA/JACE-FSC
Paula Riley	96 CEG/CEIEA

5

1

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---

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