

## APPENDICES



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**APPENDIX A**  
**INTERAGENCY AND INTERGOVERNMENTAL COORDINATION AND**  
**CONSULTATIONS**

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[Coordination and consultation documentation to be inserted here upon completion]

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DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 96TH TEST WING (AFMC)  
EGLIN AIR FORCE BASE FLORIDA

Mr. Bruce Hagedorn  
Chief, Eglin Natural Resources  
96 CEG/CEIEA  
501 De Leon Street, Suite 101  
Eglin AFB, FL 32542-5133

Ms. Cathy Tortorici  
Chief, ESA Interagency Cooperation Division  
Office of Protected Resources  
National Marine Fisheries Service  
1315 East-West Highway, 13<sup>th</sup> Floor  
Silver Spring, MD 20910

1 AUG 2019

Dear Ms. Tortorici:

This letter is being submitted to reinitiate consultation under Section 7 of the Endangered Species Act (ESA) for the Eglin Gulf Test and Training Range (EGTTR) Programmatic Biological Opinion (PBO) and Conference Report (Consultation No. FPR-2016-9151). The PBO was issued to Eglin Air Force Base (AFB) on January 13, 2017. Since then, two new species with the potential to occur in the EGTTR have been listed under the ESA: giant manta ray (*Manta birostris*), and oceanic whitetip shark (*Carcharinus longimanus*). The U.S. Air Force is requesting the National Marine Fisheries Service (NMFS) to amend the EGTTR PBO to include effects determinations for the giant manta ray and oceanic whitetip shark.

**Proposed Action**

Eglin AFB is currently developing a Supplemental Environmental Assessment (EA) for the EGTTR that would expand the location of live weapon drops in the EGTTR. The Eglin Natural Resources Office coordinated with the ESA Interagency Cooperation Division regarding this change in the proposed action and determined that the proposed expansion area would not trigger re-initiation of formal consultation under the ESA, for ESA-listed marine mammals and sea turtles. NMFS concurred with Eglin's determination on 3 July 2019 by email.

In addition, the Air Force is proposing a new activity for Combat Air Force Adversary Air (CAF ADAIR) missions, which primarily includes the release of chaff and flares into the EGTTR during aircraft operations. CAF ADAIR aircraft provide air-to-air combat simulation for U.S. and Allied air forces. The training uses electronic engagement methods, and will limit its release of materials into the marine environment to the aforementioned expendables. CAF ADAIR missions will operate from the surface to unlimited altitudes over the Gulf of Mexico, but will not use any explosives or live or inert munitions.

The amounts of chaff and flares proposed under CAF ADAIR would not exceed limits previously analyzed in the 2004 EGTTR BO (Consultation No. F/SER/2003/00201) for air-to-air testing and training activities or in the 2017 EGTTR PBO (Consultation No. FPR-2016-9151). Therefore, the analysis in this letter will consider the potential effects of all testing and training activities in the EGTTR on the newly ESA-listed species.

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## Species Descriptions

### *Giant Manta Ray*

NMFS published a final rule to list the giant manta ray as threatened under the ESA on February 21, 2018 (83 Federal Register [FR] 2916). The giant manta ray (*Manta birostris*) is the world's largest ray with a wingspan of up to 29 feet. They are filter feeders and eat large quantities of zooplankton. Giant manta rays are slow-growing, migratory animals with small, highly fragmented populations that are sparsely distributed across the world. This species is found worldwide in tropical, subtropical and temperate bodies of water and is most likely to be found offshore, in oceanic waters, and near productive coastlines. Giant manta rays have been observed in estuarine waters near oceanic inlets, potentially using these waters as nursery grounds. Information on global distribution and population sizes is lacking. Regional population sizes are small, ranging from around 100 to 1,500 individuals, and in areas subject to fishing, have significantly declined. Overall, given their life history traits, particularly their low reproductive output, giant manta ray populations are vulnerable to depletions, with low likelihood of recovery. Additional research is needed to better understand the population structure and global distribution of this species. Giant manta ray occurrence in the Gulf of Mexico is predominantly in the southern and northwest portion of the Gulf, specifically in offshore waters of the Yucatan Peninsula and Flower Garden Banks National Marine Sanctuary (NMFS, 2017a). Therefore, giant manta ray occurrence in the EGTR is possible, but is not expected to be in high abundance or regularity.

### *Oceanic Whitetip Shark*

NMFS published a final rule to list the oceanic whitetip shark as threatened under the ESA on March 1, 2018 (83 FR 4153). The oceanic whitetip (*Carcharinus longimanus*) is a large shark found in tropical and subtropical oceans throughout the world. They are a long-lived, late-maturing species that display low to moderate reproductive output. Oceanic whitetips are a pelagic species, generally remaining offshore in the open ocean, on the outer continental shelf, or around oceanic islands in water depths greater than 600 feet. They live from the surface of the water to at least 498 feet deep, but show a strong preference for the surface mixing layer in warm waters and are therefore a surface-dwelling shark. The oceanic whitetip is considered a top predator, feeding opportunistically on bony fishes and cephalopods such as squid. However, they also reportedly feed on large pelagic sportfish (e.g. tuna, marlin), sea birds, other sharks and rays, marine mammals and even garbage. The primary threat to the oceanic whitetip shark is incidental bycatch in commercial fisheries. Because of their preferred distribution in warm, tropical waters, and their tendency to remain at the surface, this species has high encounter and mortality rates in fisheries throughout their range. Juvenile oceanic whitetip sharks have been tracked in the northeastern Gulf of Mexico and essential fish habitat has been designated offshore of the Florida/Alabama border and extends west towards Texas; however there currently is no information available regarding habitat utilization of these specific areas (NMFS, 2017b). Given their habitat preference and proximity of designated essential fish habitat in the northeastern Gulf, oceanic whitetip sharks may occur regularly in the EGTR.

## Effects Determination

Stressors from testing and training activities conducted in the EGTR include the release of chaff and flares, inert weapons, and live detonations. Potential impacts to protected species resulting from these activities include: (1) ingestion of munition debris (e.g. chaff and flares, and target fragments), (2) acoustic impacts from detonations, and (3) exposure to secondary stressors (e.g. explosion byproducts, metals, and chemicals).

#### *Ingestion Impacts*

Air-to-surface and some air-to-air activities in the EGTR would release various types of military debris including inert weapons, live weapons, chaff, and flares. Giant manta rays do not spend considerable amounts of time at the water surface, therefore direct impacts from weapon releases are not likely. Oceanic whitetip sharks have a higher tendency to occur near the water surface, however the probability for an individual shark to be present near or at the water surface at the same time and location where these items are released from aircraft during missions is considered negligible. As a result, direct impacts to oceanic whitetip sharks are not likely to occur. After hitting the water surface, larger items, such as inert weapons and destroyed targets, would sink through the water column and settle to the seafloor. Smaller items including chaff, smaller target debris, and munitions casings, may temporarily float or remain suspended in the water column for longer periods of time before sinking or being transported by waves and currents. Giant manta rays feed in the water column and the potential for debris ingestion would therefore only be associated with items temporarily floating within the water column or as items slowly sink to the bottom. Oceanic whitetip sharks similarly feed mostly in the water column, but also consume flotsam located on the surface. Given the size of the EGTR and the frequency of expendable-releasing missions that remains unchanged from the previous PBO analyses, the likelihood for a giant manta ray or oceanic whitetip shark to encounter an expended item is low. Moreover, a possible encounter would not necessarily lead to ingestion. In the rare event an item is ingested, relatively small debris pieces could pass through the digestive system without adverse effects. The potential for a giant manta ray or oceanic whitetip shark to encounter a large item, ingest it, and experience physical harm is negligible.

#### *Acoustic Impacts*

Effects from acoustic sources (e.g. explosives) on the giant manta ray and the oceanic whitetip shark would be dependent on a number of factors, including the proximity of the animal to the sound source, and the duration, frequency, and intensity of the sound. Giant manta ray aggregation sites are not present in the EGTR and any occurrence within this area would therefore likely be of a solitary individual. Additionally, giant manta rays do not regularly occur within or near surface waters, further reducing probability of a possible encounter during a live weapons release. Oceanic whitetip sharks may occur within the EGTR and may occupy surface waters; however, the EGTR lies shoreward of the typical depth range for this species. While few individuals may occur in relatively shallow water, the potential for an oceanic whitetip shark to co-occur with EGTR testing and training missions involving live weapon releases based on previously analyzed mission tempos is negligible. Therefore, giant manta rays and oceanic whitetip sharks are not expected to be exposed to acoustic impacts associated with live weapons detonation during testing and training activities in the EGTR.

#### *Impacts from Secondary Stressors*

Secondary stressors associated with explosive ordnance activities could pose indirect impacts to giant manta rays and oceanic whitetip sharks through habitat degradation, habitat alteration, or an effect on prey availability. Effects to habitat and prey availability may result from explosives, explosion byproducts and unexploded ordnance, metals and chemicals. Explosion byproducts are not toxic to marine organisms at realistic exposure levels. Relatively low solubility of most explosives and their degradation products means that concentrations of these contaminants in the marine environment would be relatively low, reducing potential availability for uptake from within the water column. Furthermore, these low concentration levels

of contaminants would be easily diluted through currents and wave action. Giant manta rays and oceanic whitetip sharks could be impacted by the effects of chemical materials and metals deposited into the water; however, these materials would have negligible effects on water quality and would not result in degradation of the physical marine environment. Therefore, no impacts to giant manta rays or oceanic whitetip sharks would result from secondary stressors such as water quality or habitat degradation.

#### Conclusions

Based on this analysis, Eglin Natural Resources has determined that testing and training activities in the EGTTTR **may affect, but are not likely to adversely affect** the giant manta ray and the oceanic whitetip shark. *Adherence to the mitigation measures outlined in Chapter 6.3 of the 2017 EGTTTR PBO is expected to significantly reduce the potential for adverse impacts to these ESA-listed species.*

If you have any questions regarding this amendment to the Programmatic Biological Opinion, please do not hesitate to contact either Mr. Rodney Felix at (850) 883-1153 or myself at (850) 882-8391.

Sincerely,



BRUCE W. HAGEDORN, NH-03  
Chief, Natural Resources Office  
Eglin AFB, Florida

#### References

- NMFS. (2017a). *Endangered Species Act Status Review Report: Giant Manta Ray (Manta birostris) and Reef Manta Ray (Manta alfredi)*. Silver Spring, MD: NMFS.
- NMFS. (2017b). *Endangered Species Act Status Review Report: Oceanic Whitetip Shark (Carcharhinus longimanus)*. Silver Spring, MD: NMFS.

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**APPENDIX B**  
**NOISE**

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**Appendix B-1**

**Sound, Noise, and Potential Effects**

**Located in Administrative Record**

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**Appendix B-2**  
**Noise Modeling**

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1 B.2 NOISE MODELING  
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3 The following sections describe input data used in the noise modeling process. These data were developed  
4 in coordination with the Air Force Air Combat Command (ACC), Air Force Civil Engineer Center, and Tyndall  
5 Air Force Base (AFB) personnel.  
6

7 *B.2.1 Airfield Operations*  
8

9 The first step in estimating the effects of the contract ADAIR  
10 action was to determine the baseline operations at Tyndall  
11 AFB. The baseline operations were identified through the 2016  
12 Air Installations Compatible Use Zones (AICUZ) Study. The  
13 AICUZ study did a thorough evaluation of the operations at  
14 Tyndall AFB before Hurricane Michael. The aircraft operations  
15 identified from that study were determined appropriate by the  
16 Air Force for use as the baseline for contract ADAIR. The  
17 baseline has a total of 66,360 operations at the airfield. **Table**  
18 **B-5** contains the breakout of those operations by aircraft type  
19 and organization. **Table B-6** contains the operations to be  
20 modeled for the baseline as well as the contract ADAIR aircraft  
21 operations.

A SORTIE IS A SINGLE FLIGHT, BY ONE AIRCRAFT, FROM TAKEOFF TO LANDING WHILE A SORTIE-OPERATION IS THE USE OF ONE AIRSPACE UNIT (E.G., MILITARY OPERATIONS AREA) BY ONE AIRCRAFT. THE NUMBER OF SORTIE-OPERATIONS IS USED TO QUANTIFY THE NUMBER OF USES BY AIRCRAFT AND TO ACCURATELY MEASURE POTENTIAL IMPACTS (E.G., NOISE, AIR QUALITY, AND SAFETY IMPACTS). A SORTIE-OPERATION IS NOT A MEASURE OF HOW LONG AN AIRCRAFT USES AN AIRSPACE UNIT, NOR DOES IT INDICATE THE NUMBER OF AIRCRAFT IN AN AIRSPACE UNIT DURING A GIVEN PERIOD; IT IS A MEASUREMENT FOR THE NUMBER OF TIMES A SINGLE AIRCRAFT USES A PARTICULAR AIRSPACE UNIT.

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Table B-5  
Baseline Operations at Tyndall Air Force Base

Category	Squadron / Unit / Group	Aircraft	Modeled Type (if different) or engine designation	AB Departure			Standard/MIL Departure			Overhead Arrivals			Straight In Arrivals			Closed Pattern <sup>1</sup>			Total		
				Day (0700- 2200)	Night (2200- 0700)	Total	Day (0700- 2200)	Night (2200- 0700)	Total	Day (0700- 2200)	Night (2200- 0700)	Total	Day (0700- 2200)	Night (2200- 0700)	Total	Day (0700- 2200)	Night (2200- 0700)	Total	Day (0700- 2200)	Night (2200- 0700)	Total
Based	95 FS	F-22A		340	2	342	3059	15	3074	2549	13	2562	850	4	854	342	2	344	7138	36	7174
	2 FTS	T-38A		5314	54	5368	-	-	-	1063	11	1074	4251	43	4294	1063	11	1074	11691	119	11810
	43 FS	F-22A		437	2	439	3933	20	3953	1311	7	1318	3059	15	3074	21850	110	21960	30590	154	30744
	53 WEG	DF-16/QF-16	F-16C	465	-	465	285	-	285	304	3	307	442	1	443	702	3	705	2198	7	2205
		E-9	DHC-8*	-	-	-	220	-	220	22	-	22	196	2	198	-	-	-	438	2	440
	337 ACS	MU-2	Cessna 441	-	-	-	1932	20	1952	-	-	-	1932	20	1952	429	4	433	4293	44	4337
Transient	33 FW <sup>2</sup>	F-35A		1	-	1	34	-	34	4	-	4	31	-	31	6830	-	6830	6900	-	6900
	Fighter	F-15E	F-15E (F100-PW-220)	264	5	269	-	-	-	-	-	-	264	5	269	59	9	68	587	19	606
		F-16C	F100-PW-220	198	2	200	-	-	-	-	-	-	198	2	200	-	-	-	396	4	400
		FA-18	FA-18E/F	55	-	55	-	-	-	-	-	-	55	-	55	-	-	-	110	-	110
		F-22A		197	2	199	-	-	-	-	-	-	197	2	199	-	-	-	394	4	398
		T-38	T-38C	109	1	110	-	-	-	-	-	-	109	1	110	218	2	220	436	4	440
	Large Cargo	C-17		-	-	-	15	-	15	-	-	-	15	-	15	-	-	-	30	-	30
		C-5	C-5A	-	-	-	4	-	4	-	-	-	4	-	4	-	-	-	8	-	8
	Tanker	KC-10	KC-10A	-	-	-	24	4	28	-	-	-	24	4	28	-	-	-	48	8	56
		KC-135R		-	-	-	79	2	81	-	-	-	79	2	81	-	-	-	158	4	162
	Small Jet	C-21	C-21A	-	-	-	46	1	47	-	-	-	46	1	47	-	-	-	92	2	94
	Jet Airliner	B-757	B-757-200-RR	-	-	-	32	-	32	-	-	-	32	-	32	-	-	-	64	-	64
	4-eng Prop	C-130	C-130H&N&P	-	-	-	59	-	59	-	-	-	59	-	59	-	-	-	118	-	118
	2-eng Prop	C-12		-	-	-	48	1	49	-	-	-	48	1	49	-	-	-	96	2	98
	1-eng Prop	T-41		-	-	-	13	-	13	-	-	-	13	-	13	-	-	-	26	-	26
		T-6		-	-	-	17	3	20	-	-	-	17	3	20	-	-	-	34	6	40
	Helicopter	H-60	UH-60A	-	-	-	48	3	51	-	-	-	48	3	51	-	-	-	96	6	102
Based Totals				6556	58	6614	9429	55	9484	5249	34	5283	10730	85	10815	24384	130	24514	56348	362	56710
Transient Totals				824	10	834	419	14	433	4	0	4	1239	24	1263	7107	11	7118	9593	59	9652
Grand Totals				7380	68	7448	9848	69	9917	5253	34	5287	11969	109	12078	31491	141	31632	65941	421	66362

Notes:

- 0) All operations shown to the nearest integer
- 1) Each circuit counted as two operations
- 2) Actual A/B departure and overhead arrival percentages are 1% and 10%, respectively. Operations shown are rounded to a non-zero integer. Noise modeling utilized the exact percentage.

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Table B-6  
Baseline Training Operations at Tyndall Air Force Base Plus Contract Adversary Air Operations

Category	Squadron / Unit / Group	Aircraft	Modeled Type (if different) or engine designation	AB Departure			Standard/MIL Departure			Overhead Arrivals			Straight In Arrivals			Closed Pattern <sup>1</sup>			Total		
				Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total	Day (0700-2200)	Night (2200-0700)	Total
Based	95 FS	F-22A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 FTS	T-38A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	43 FS	F-22A		5	-	5	43	-	43	-	-	-	1407	7	1414	10051	51	10102	11506	58	11564
	53 WEG	DF-16/QF-16	F-16C	465	-	465	285	-	285	304	3	307	442	1	443	702	3	705	2198	7	2205
		E-9	DHC-8*	-	-	-	220	-	220	22	-	22	196	2	198	-	-	-	438	2	440
	337 ACS	MU-2	Cessna 441	-	-	-	1932	20	1952	-	-	-	1932	20	1952	429	4	433	4293	44	4337
	ADAIR	CAT C		2400	-	2400	-	-	-	2040	-	2040	360	-	360	648	-	648	5448	-	5448
Transient	33 FW <sup>2</sup>	F-35A		1	-	1	34	-	34	4	-	4	31	-	31	6830	-	6830	6900	-	6900
	Fighter	F-15E	F-15E (F100-PW-220)	264	5	269	-	-	-	-	-	-	264	5	269	59	9	68	587	19	606
		F-16C	F100-PW-220	198	2	200	-	-	-	-	-	-	198	2	200	-	-	-	396	4	400
		FA-18	FA-18E/F	55	-	55	-	-	-	-	-	-	55	-	55	-	-	-	110	-	110
		F-22A		249	2	251	-	-	-	-	-	-	249	2	251	-	-	-	498	4	502
		T-38	T-38C	109	1	110	-	-	-	-	-	-	109	1	110	218	2	220	436	4	440
	Large Cargo	C-17		-	-	-	3	-	3	-	-	-	3	-	3	-	-	-	6	-	6
		C-5	C-5A	-	-	-	1	-	1	-	-	-	1	-	1	-	-	-	2	-	2
	Tanker	KC-10	KC-10A	-	-	-	5	1	6	-	-	-	5	1	6	-	-	-	10	2	12
		KC-135R		-	-	-	16	-	17	-	-	-	16	1	17	-	-	-	32	2	34
	Small Jet	C-21	C-21A	-	-	-	46	1	47	-	-	-	46	1	47	-	-	-	92	2	94
	Jet Airliner	B-757	B-757-200-RR	-	-	-	6	-	6	-	-	-	6	-	6	-	-	-	12	-	12
	4-eng Prop	C-130	C-130H&N&P	-	-	-	12	-	12	-	-	-	12	-	12	-	-	-	24	-	24
	2-eng Prop	C-12		-	-	-	48	1	49	-	-	-	48	1	49	-	-	-	96	2	98
	1-eng Prop	T-41		-	-	-	13	-	13	-	-	-	13	-	13	-	-	-	26	-	26
		T-6		-	-	-	17	3	20	-	-	-	17	3	20	-	-	-	34	6	40
	Helicopter	H-60	UH-60A	-	-	-	48	3	51	-	-	-	48	3	51	-	-	-	96	6	102
Based Totals				2870	0	2870	2480	20	2500	2366	3	2369	4337	30	4367	11830	58	11888	23883	111	23994
Transient Totals				876	10	886	248	10	258	4	0	4	1121	20	1140	7107	11	7118	9356	51	9406
Grand Totals				3746	10	3756	2728	30	2758	2370	3	2373	5458	50	5507	18937	69	19006	33239	161	33400

Notes:

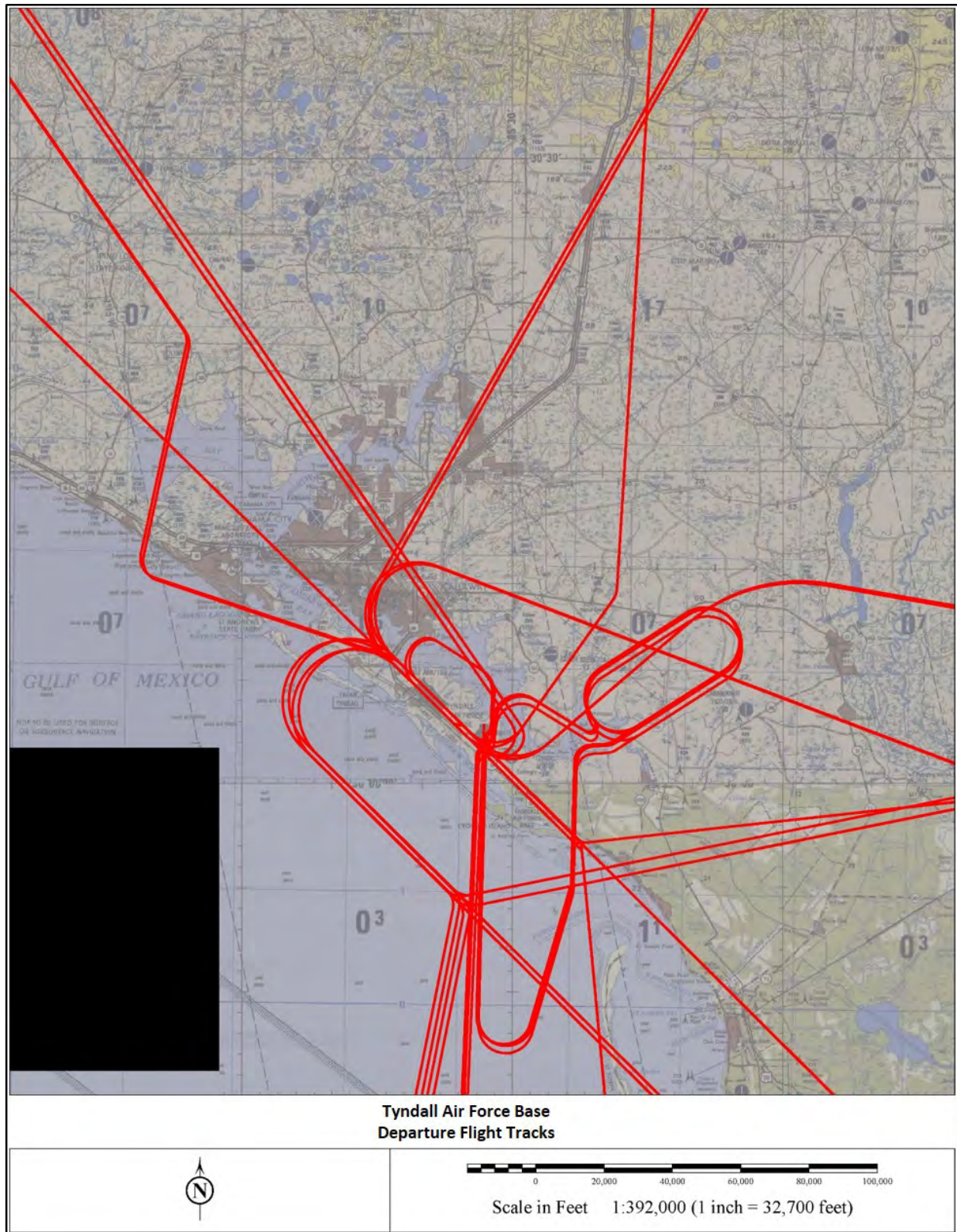
- 1) Each circuit counted as two operations
- 2) Actual A/B departure and overhead arrival percentages are 1% and 10%, respectively. Operations shown are rounded to a non-zero integer. Noise modeling will use the exact percentage.
- 3) ADAIR operations apply only to the Proposed Action in scenarios to be modeled as F-18 E/F, F-16C, or F-16A for High , Medium , and Low Noise Category C Proposed Action Scenarios, respectively.

## B.2.2 Runway and Flight Track Use

This section describes the flight tracks used by the aircraft operating out of Tyndall AFB as well as the runway utilization. For the purposes of this analysis, operations are based on pre-hurricane conditions. Utilization percentages are provided for each runway in **Table B-7**. Flight track maps for all aircraft are presented on **Figure B-13** (departures), **Figure B-14** (arrivals), and **Figure B-15** (closed patterns). Closed pattern flight track represent aircraft patterns that depart and arrive on the same runway. Example flight profiles that use closed pattern flight tracks are simulated flame out and visual flight rules pattern profiles.

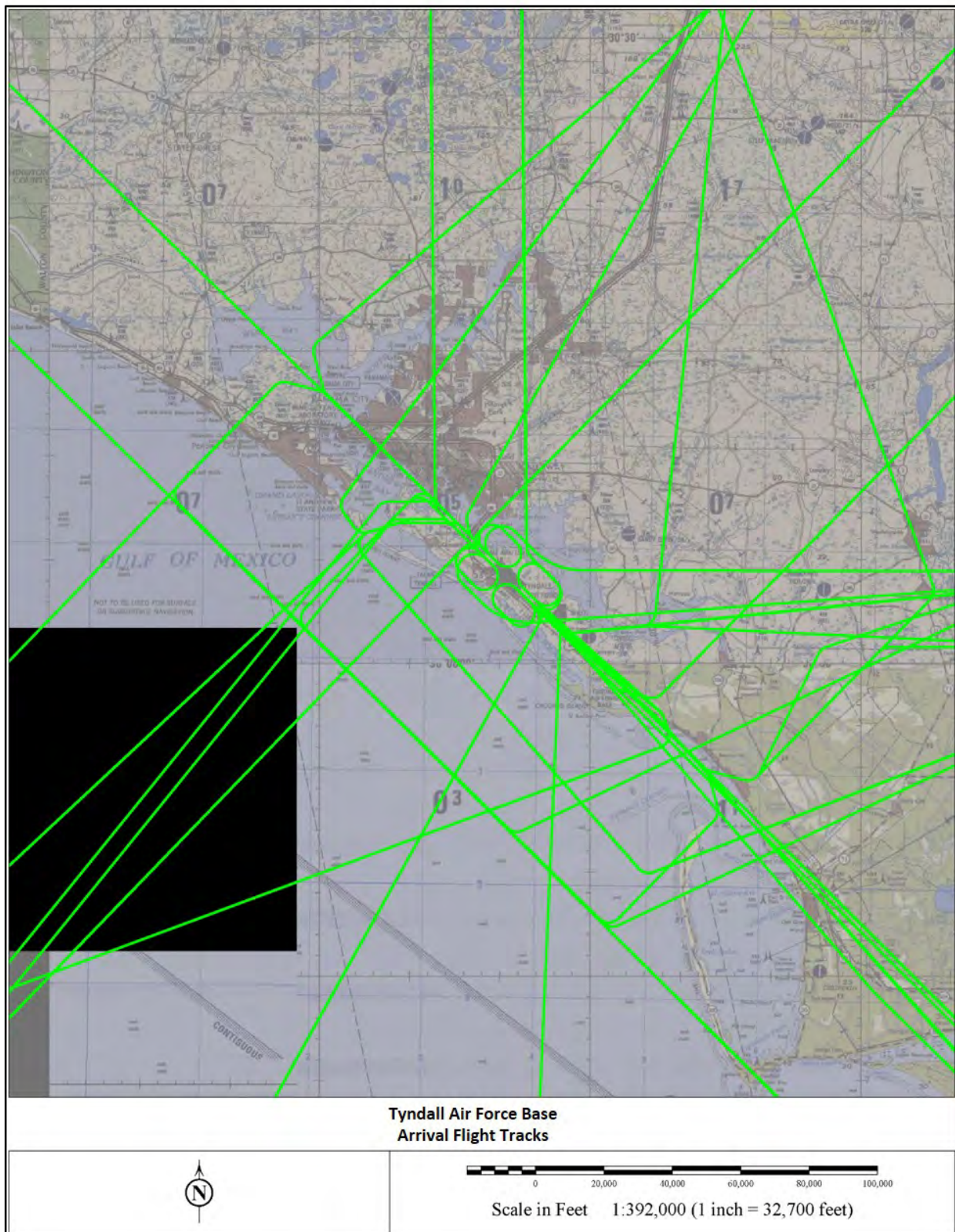
**Table B-7**  
**Runway Usage for Based Aircraft at Tyndall Air Force Base**

Operation Type	Runway Direction	%	L/R	Based					Transient		Based			
				T-38A 2 FTS	F-22 95 FS	F22 43FS	E-9 53 WEG	MU-2 337 ACS	F-35A	Other	DF-16/QF-16 53 WEG			
											Runway Direction	%	L/R	%
Arrival	14	43%	14L	91%	84%	90%	68%	46%	100%	100%	14	25%	14L	41%
			14R	9%	16%	10%	32%	54%	-	-			14R	59%
	32	57%	32L	9%	16%	10%	33%	54%	-	-	32	33%	32L	60%
			32R	91%	84%	90%	67%	46%	100%	100%			32R	40%
	1	-	-	-	-	-	-	-	-	-	1	42%	-	-
Closed Pattern	14	43%	14L	91%	80%	80%	-	100%	80%	100%	14	17%	14L	38%
			14R	9%	20%	20%	-	-	20%	-			14R	62%
	32	57%	32L	9%	20%	20%	-	-	20%	-	32	23%	32L	62%
			32R	91%	80%	80%	-	100%	80%	100%			32R	38%
	1	-	-	-	-	-	-	-	-	-	1	60%	-	-
Departure	14	43%	14L	98%	30%	30%	60%	10%	-	-	14	25%	14L	10%
			14R	2%	70%	70%	40%	90%	100%	100%			14R	90%
	32	57%	32L	2%	70%	70%	39%	90%	100%	100%	32	33%	32L	90%
			32R	98%	30%	30%	61%	10%	-	-			32R	10%
	19	-	-	-	-	-	-	-	-	-	19	42%	-	-



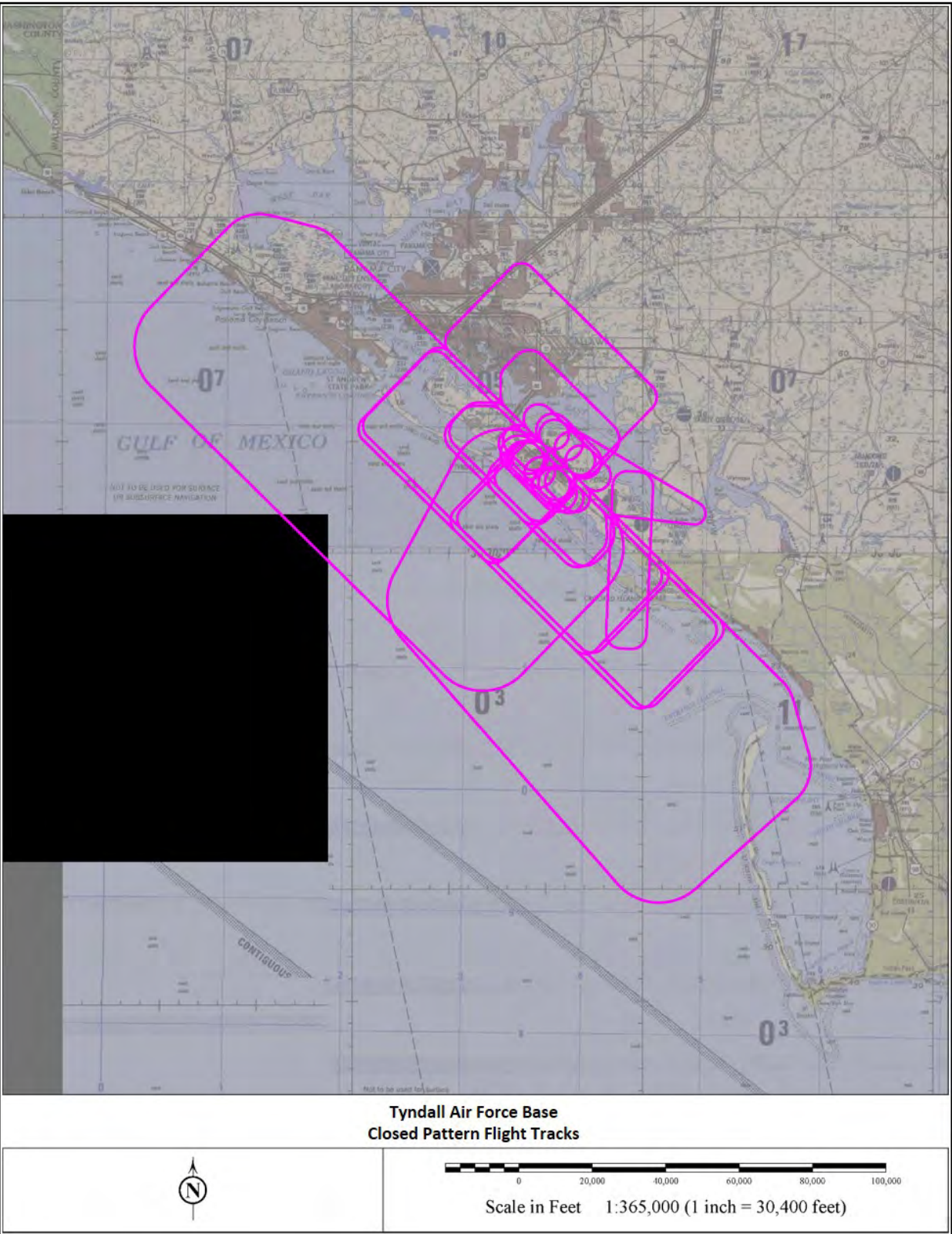
Note: The blank areas in the above image are areas in which Compressed Arc Digitized Raster Graphic map images are not available.

**Figure B-13. Departure Flight Tracks at Tyndall Air Force Base.**



Note: The blank areas in the above image are areas in which Compressed Arc Digitized Raster Graphic map images are not available.

**Figure B-14. Arrival Flight Tracks at Tyndall Air Force Base.**



Note: The blank areas in the above image are areas in which Compressed Arc Digitized Raster Graphic map images are not available.

**Figure B-15. Closed Pattern Flight Tracks at Tyndall Air Force Base.**

### B.2.3 Flight Profiles and Aircraft

The ADAIR program would locate contractor aircraft at Tyndall AFB with the appropriate capabilities to provide contracted ADAIR support for Eglin AFB.. The Air Force identified three categories of aircraft with differing capabilities (A, B, and C) on the contract. Tyndall AFB is designated a Category C location. To fulfill the requirements of a category a contractor could provide a variety of aircraft with the appropriate specifications. Because the type of aircraft for contract ADAIR are not known at this time, representative noise surrogates were selected for the lowest through highest potential noise emission scenarios for the aircraft that contractors may select to provide for each of the categories. To model a given noise scenario for a certain category, all contract ADAIR flight operations were assigned to the surrogate. All three scenarios for Category C were modeled separately in the final analysis for Tyndall AFB. The surrogates for Category C are presented in **Table B-8**.

**Table B-8**  
**Aircraft Scenarios**

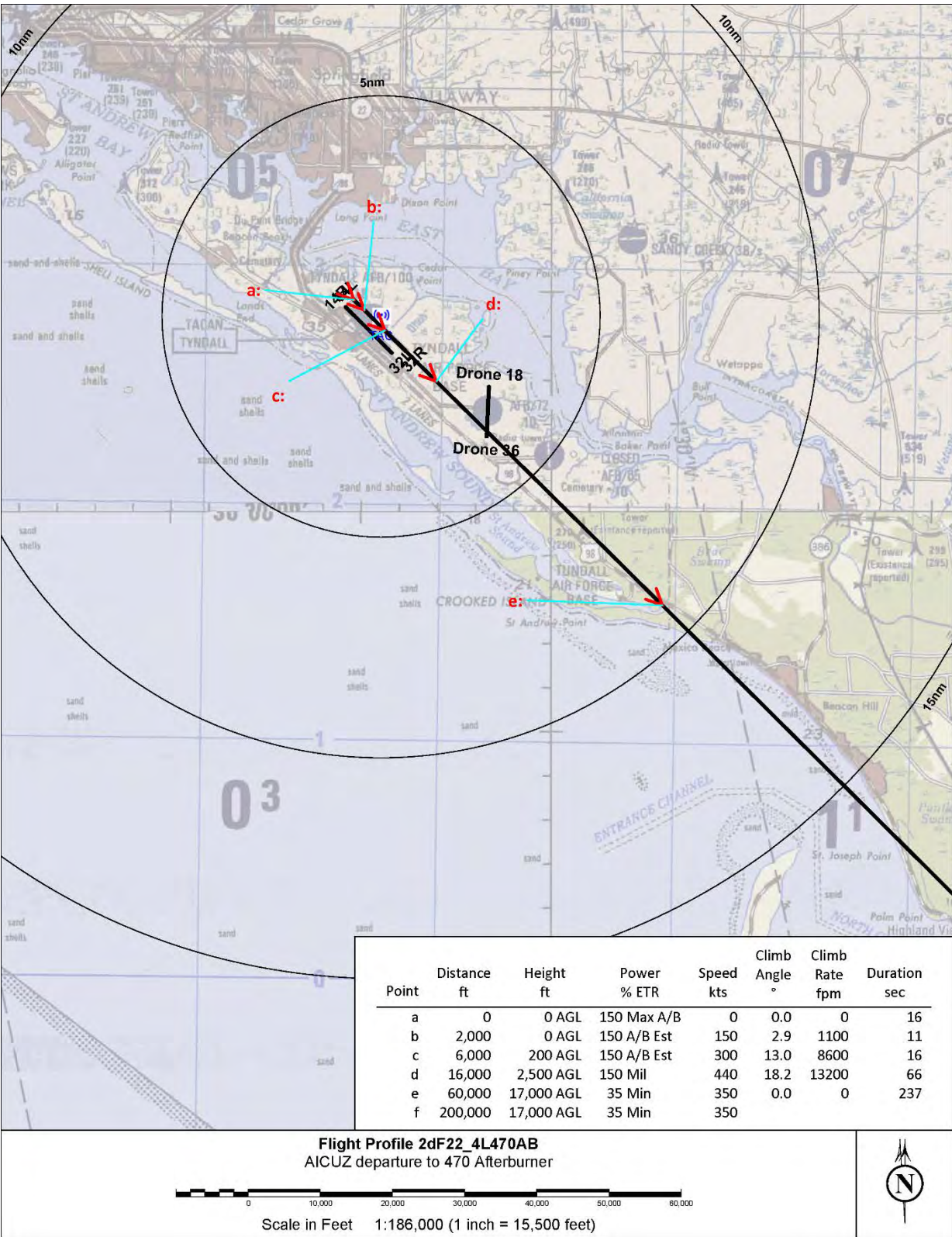
Category	High Noise Scenario	Medium Noise Scenario	Low Noise Scenario
C	Eurofighter Typhoon (F-18E/F surrogate)	Dassault Mirage (F-16C F100-PW-220 Engine surrogate)	JAS 39 Gripen (F-16A F100-PW-100 Engine surrogate)

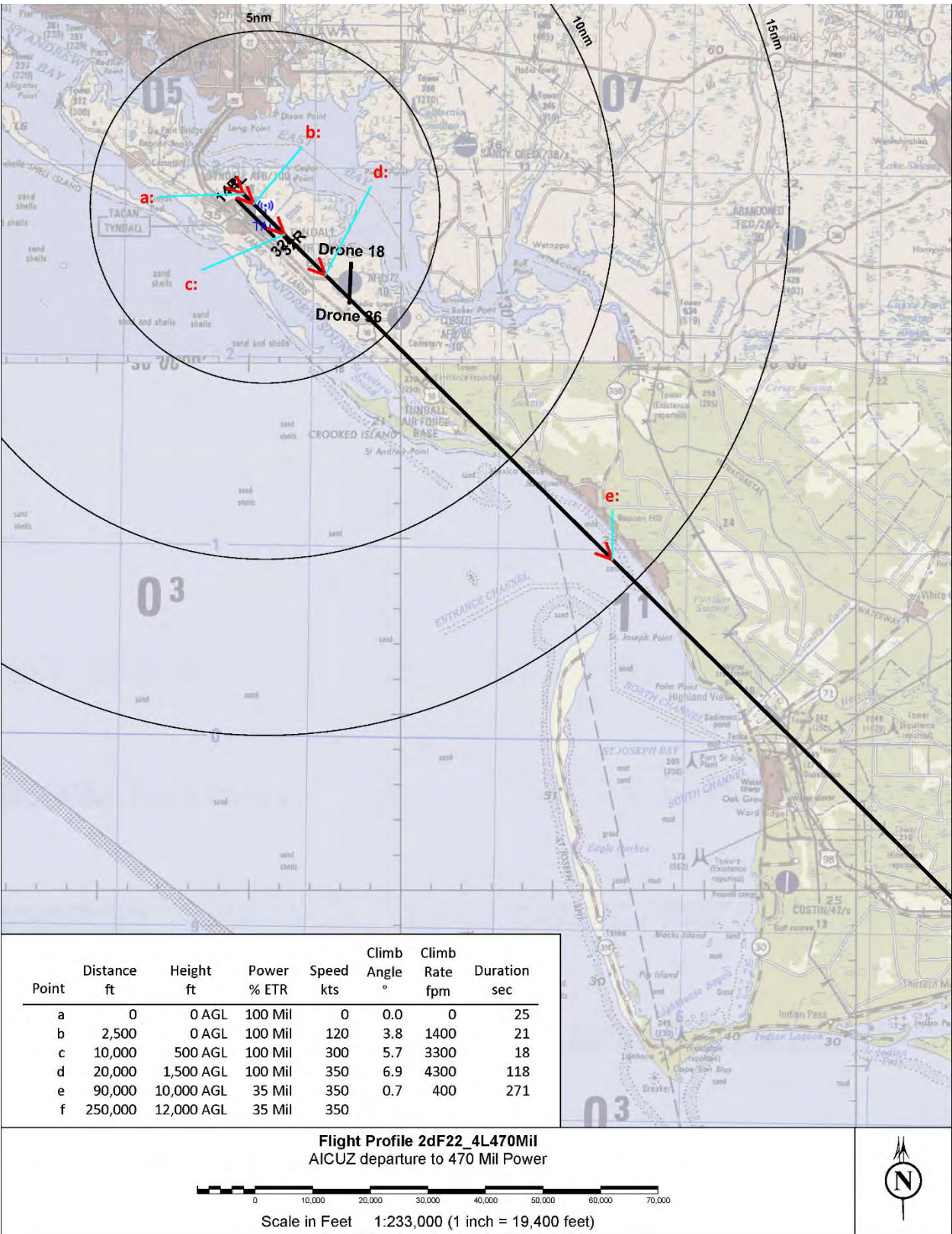
This section details the representative profiles for the aircraft with the most operations that were based at Tyndall AFB prior to the hurricane. This includes the F-22A aircraft of the 95 and 42 FSs and the T-38As of the 2 FTS. Also included are the representative profiles for the proposed contract ADAIR aircraft for Category C. The Category C aircraft are modeled as the F-16A with a F100-PW-100 engine for the Low Noise Scenario, the F-16C with the F100-PW-220 engine for the Medium Noise Scenario, and the F-18E/F for the High Noise Scenario. Because it is unknown which aircraft type or combination thereof that the contractor would bring to Tyndall AFB, each scenario is modeled separately as if it were the only aircraft in the contract ADAIR inventory.

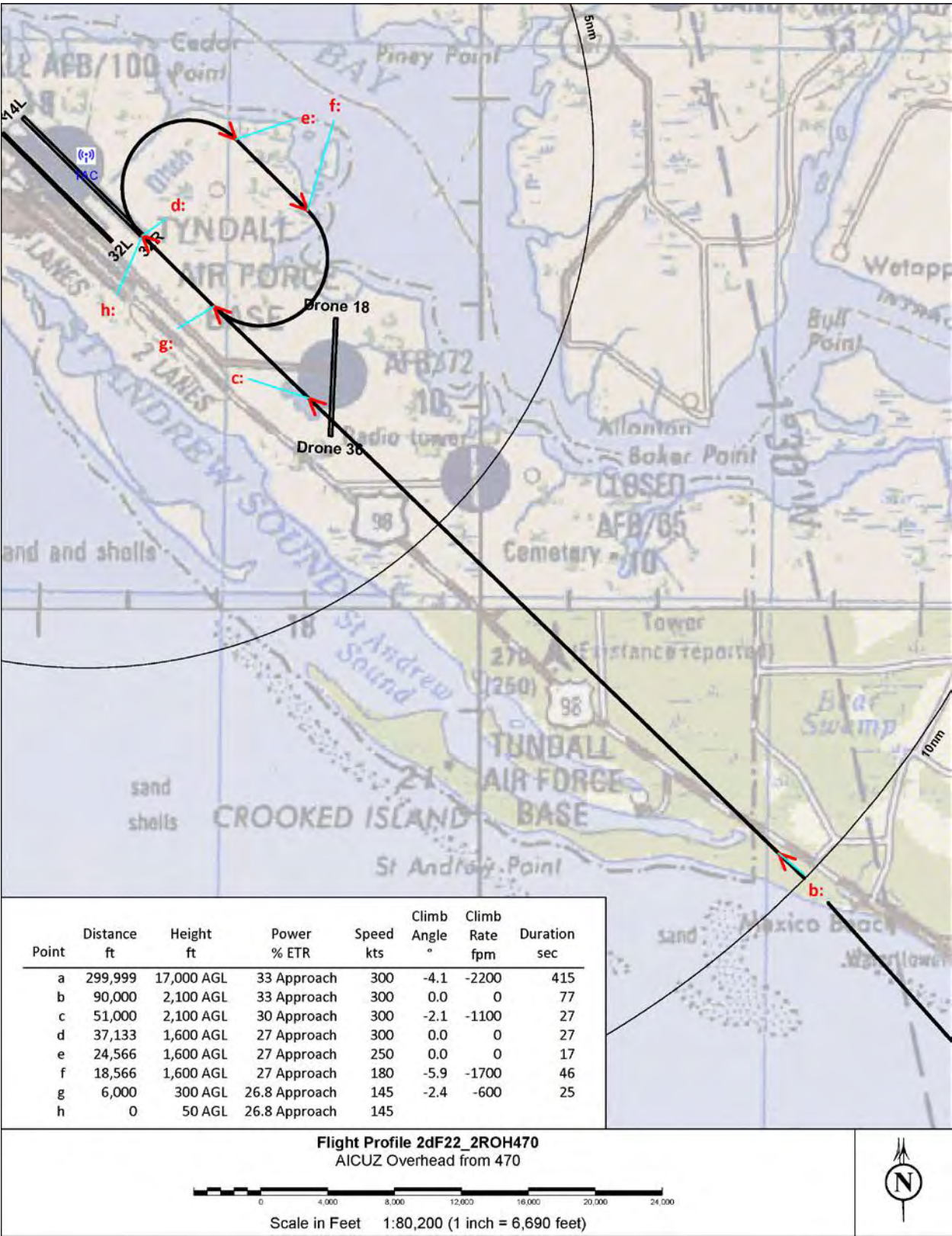
Representative profiles provide the speed and power setting of each type of aircraft as a function of distance along the flight track for the representative maneuvers. For modeling purposes, the appropriate profile is used for all flight tracks that conform to that maneuver type. For example, all overhead break arrival tracks utilize the representative profile for modeling that maneuver.

The operations tables (**Tables B-5 and B-6**) can be used with the runway usage table (**Table B-7**) to understand the distribution of the following representative profiles that will be modeled on tracks associated with each runway.

B.2.3.1 Based Aircraft Representative Flight Profiles  
Flight Profiles for 95th and 43d Fighter Squadrons' F-22As

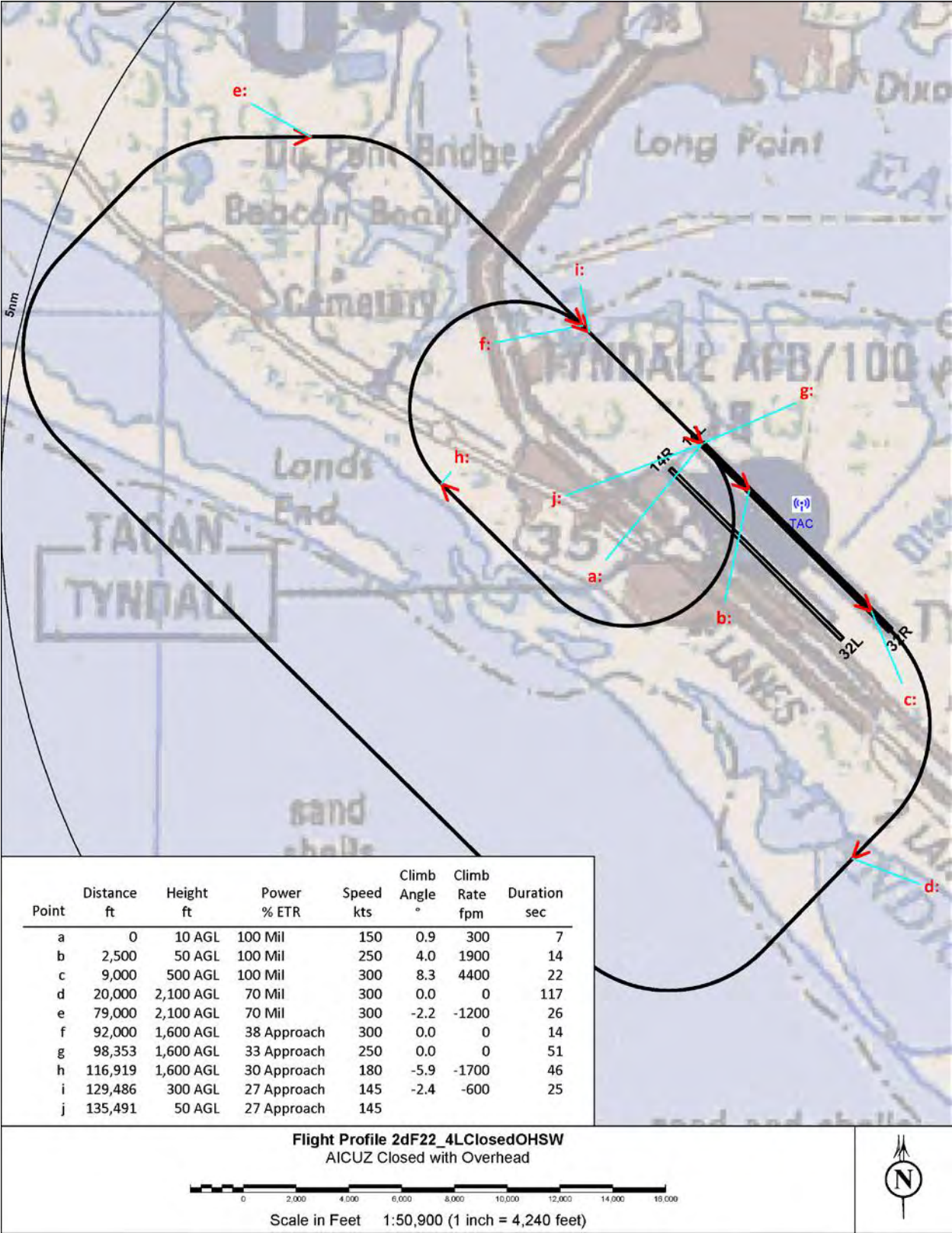


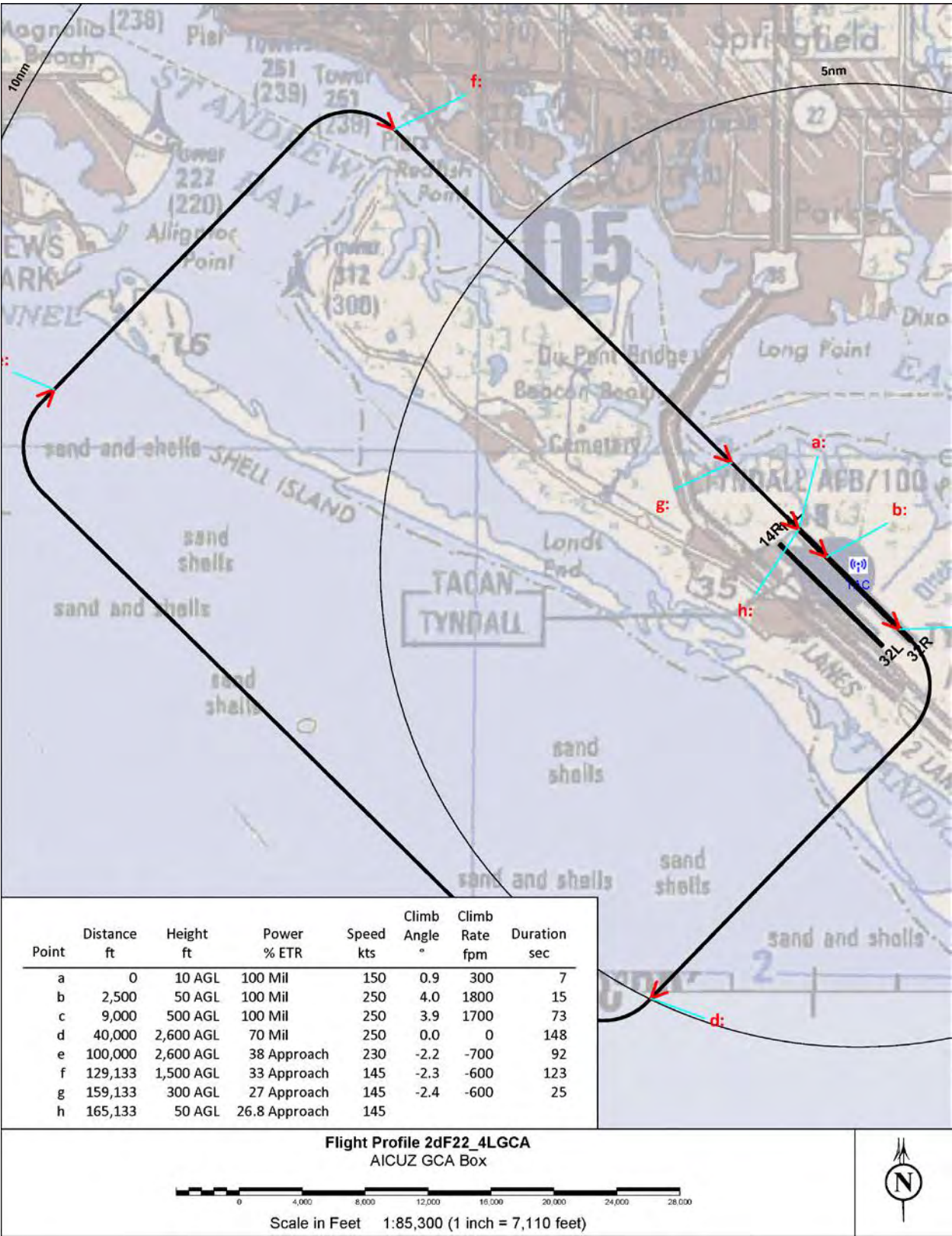


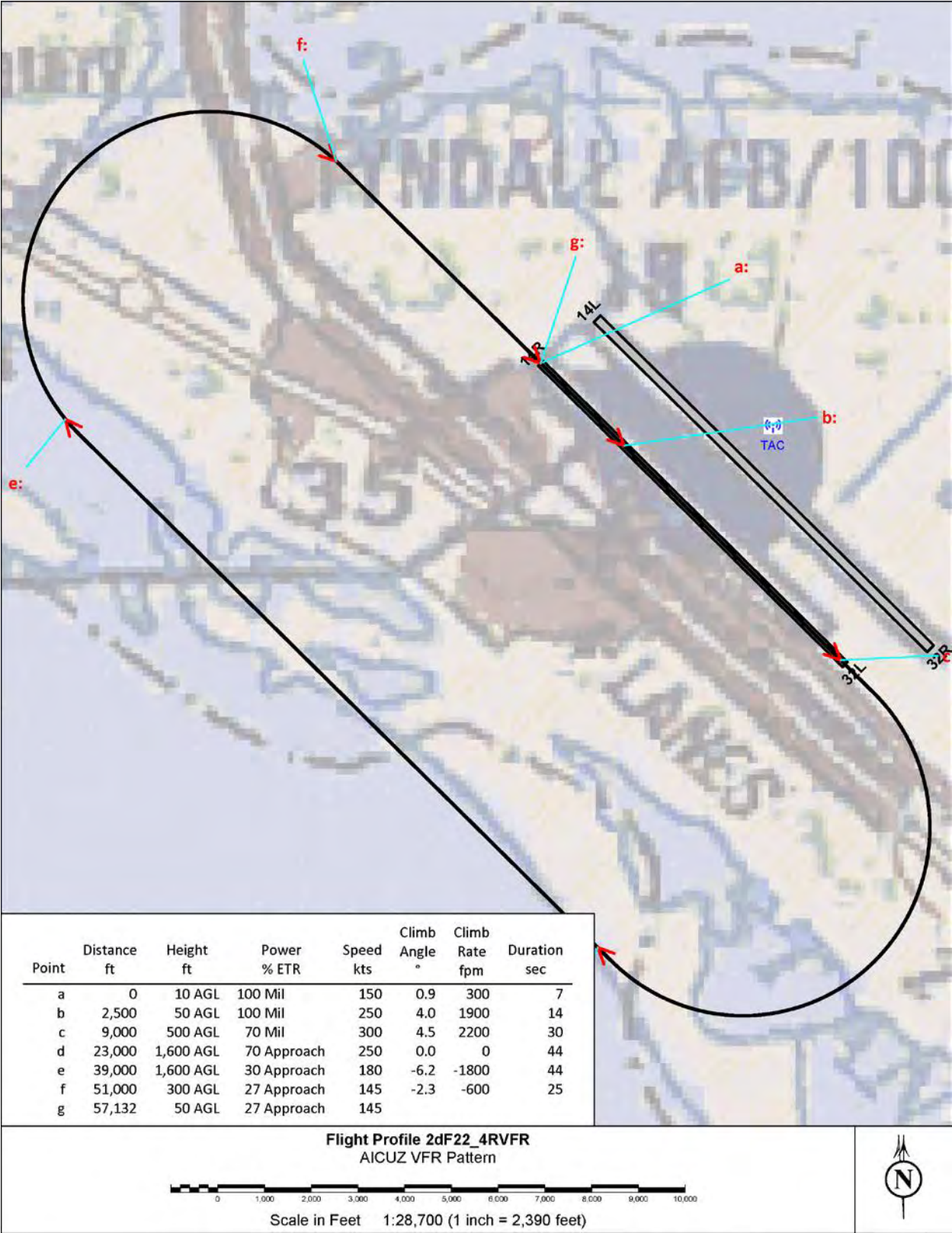


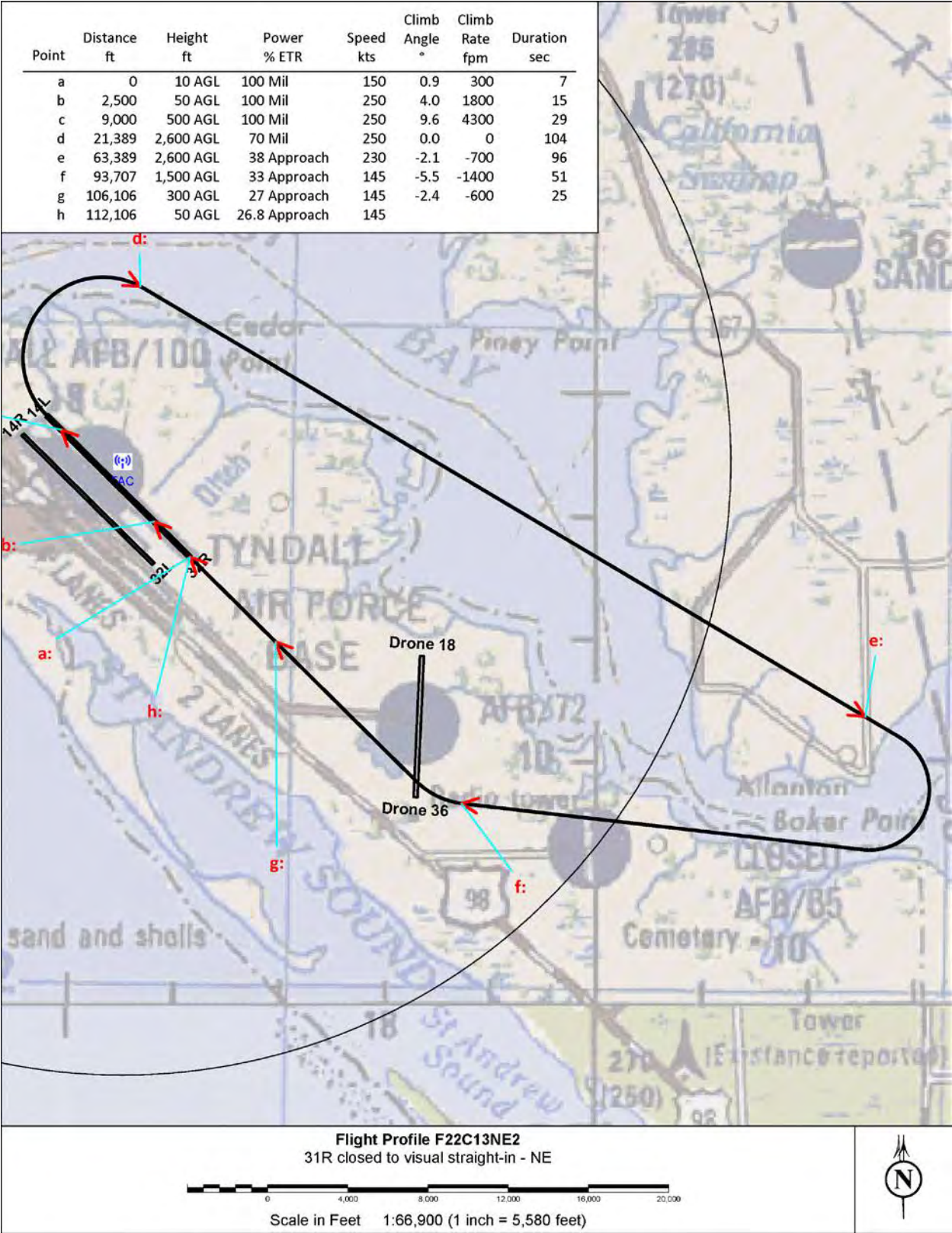


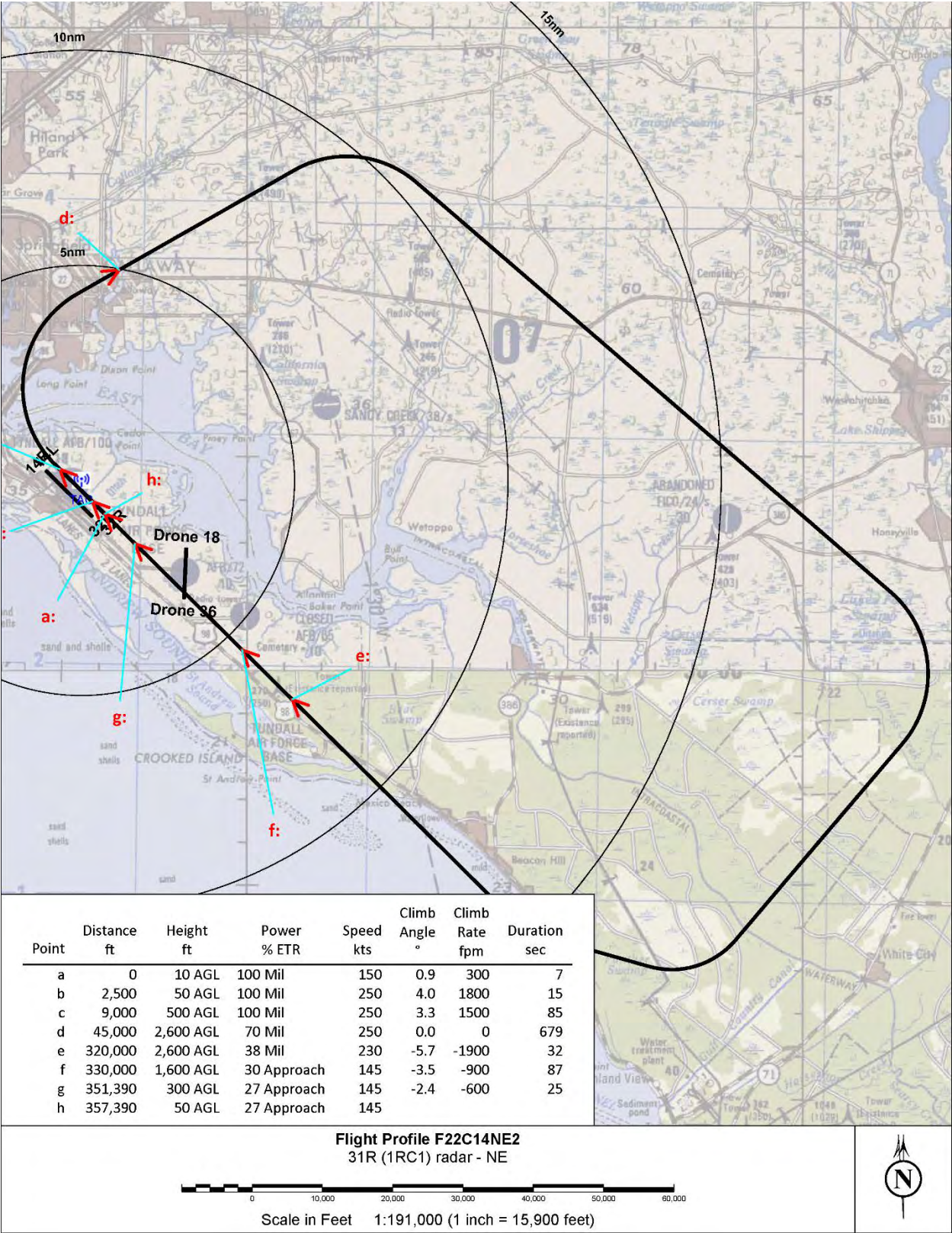






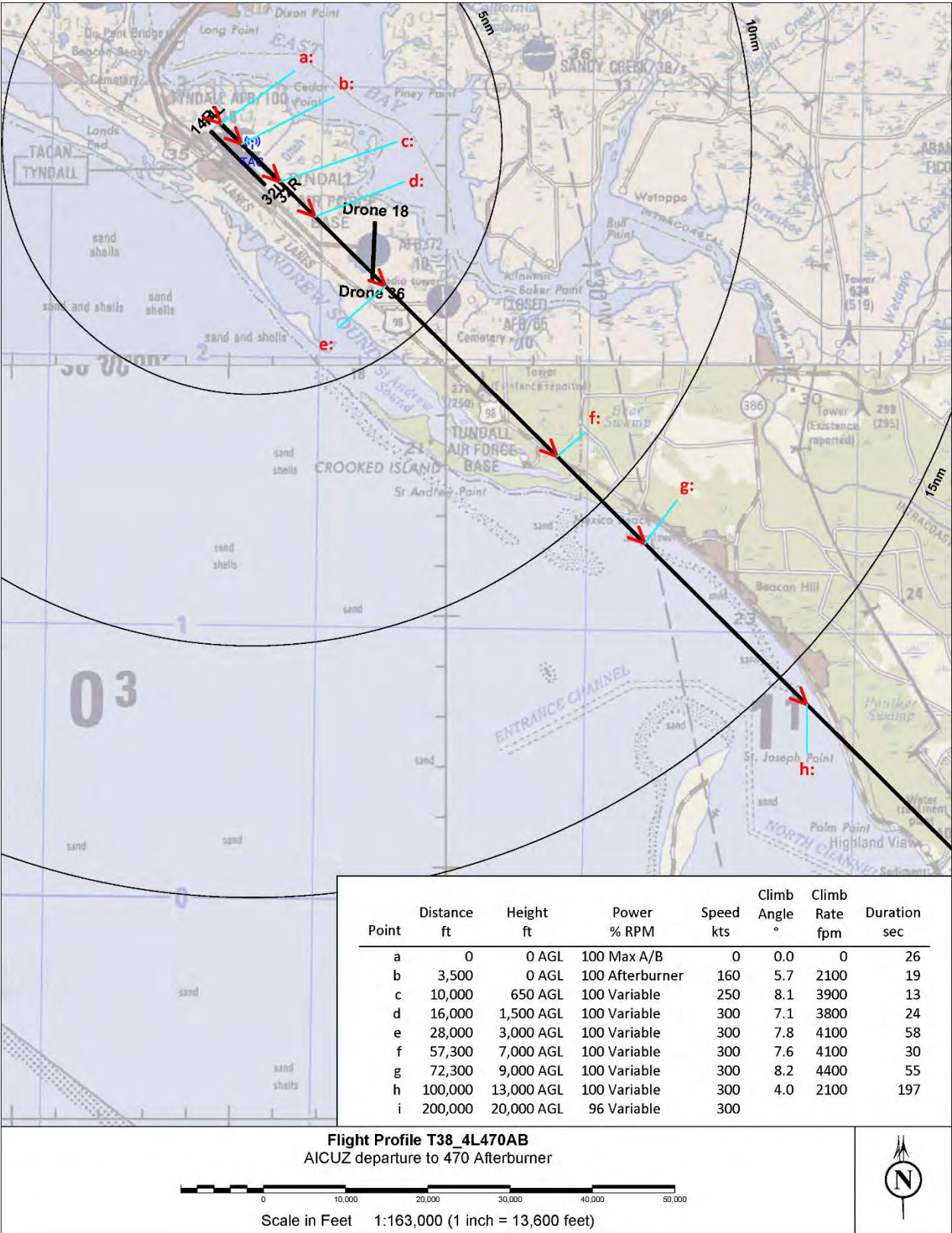


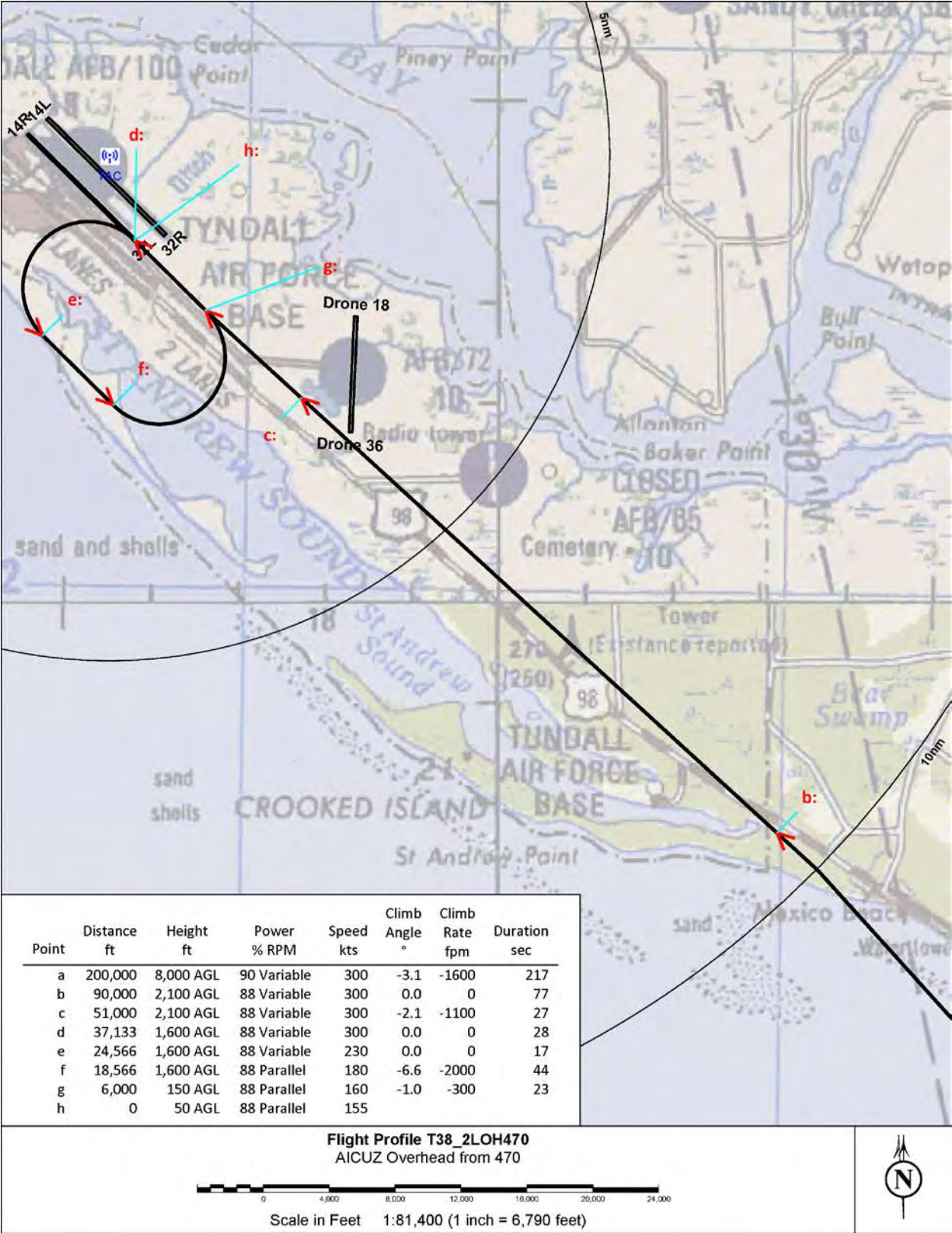


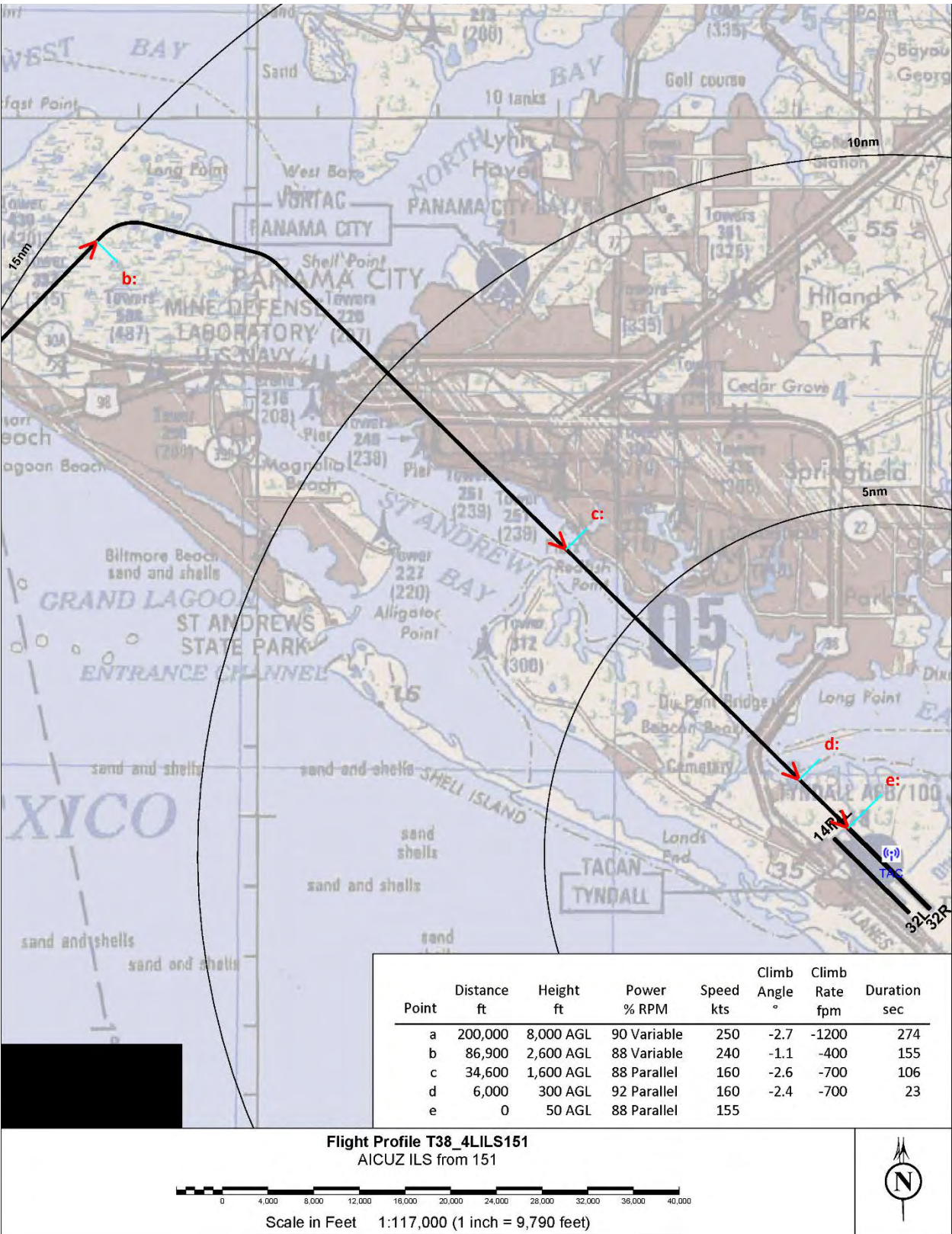


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Flight Profiles for 2d FTS T-38-As



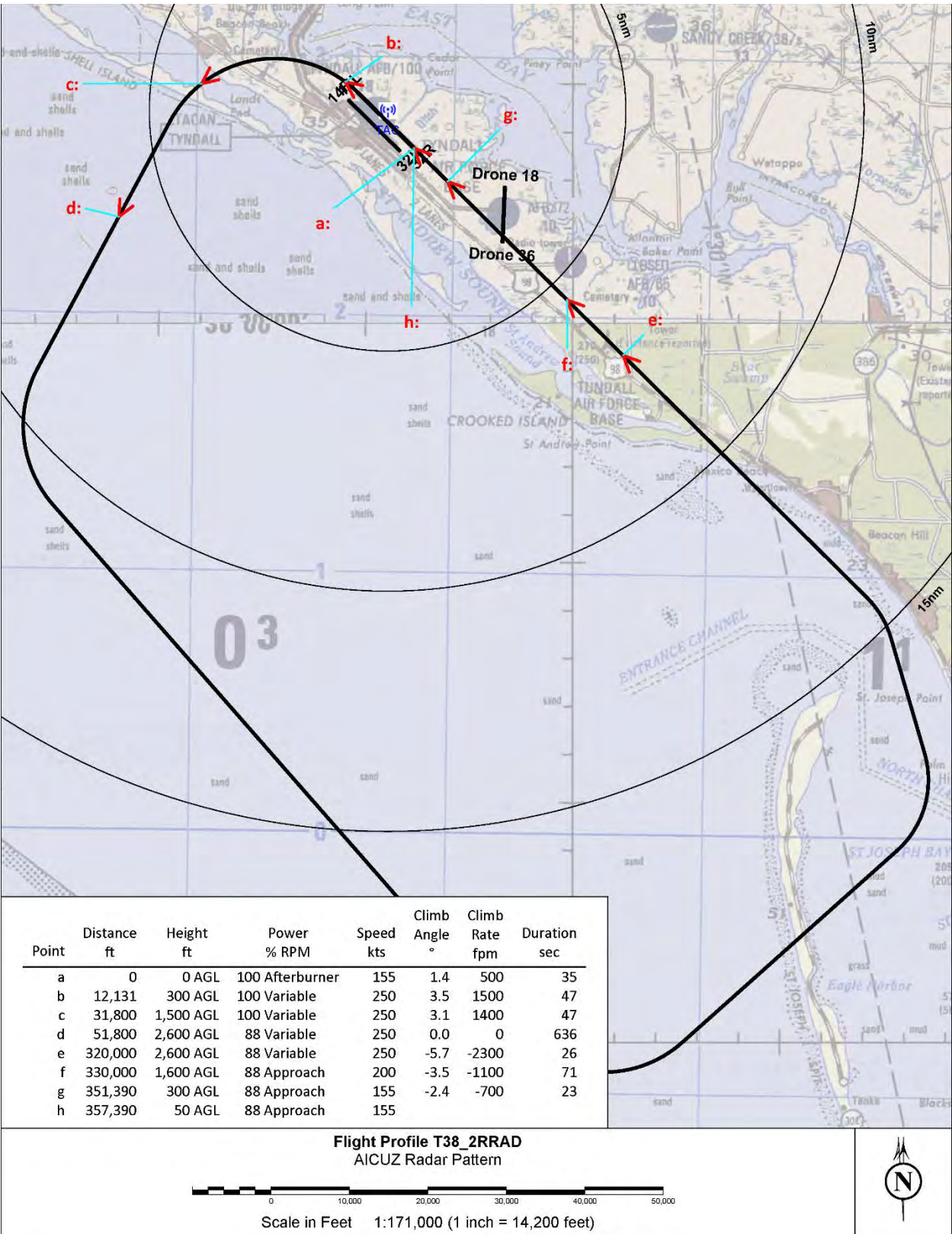


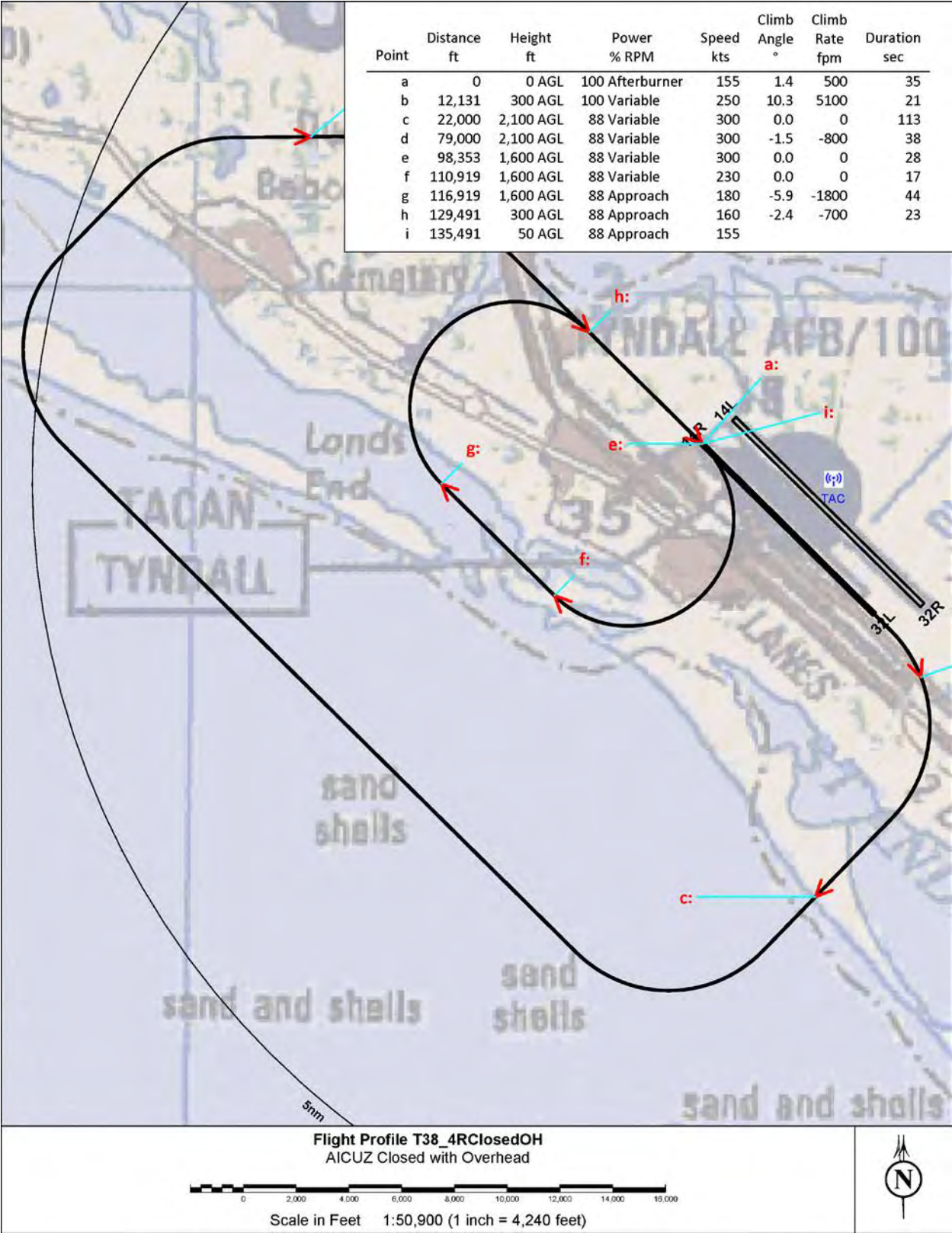


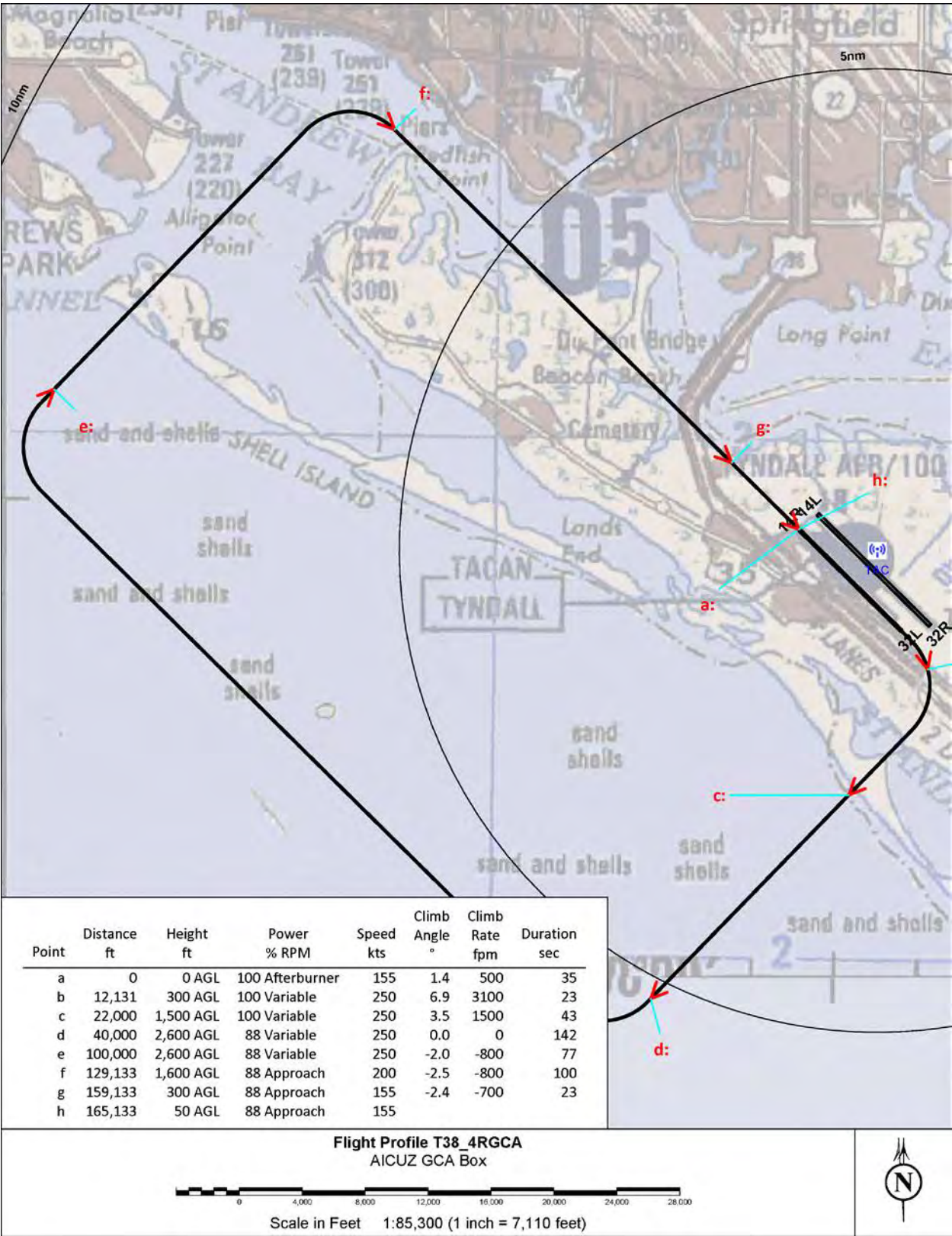
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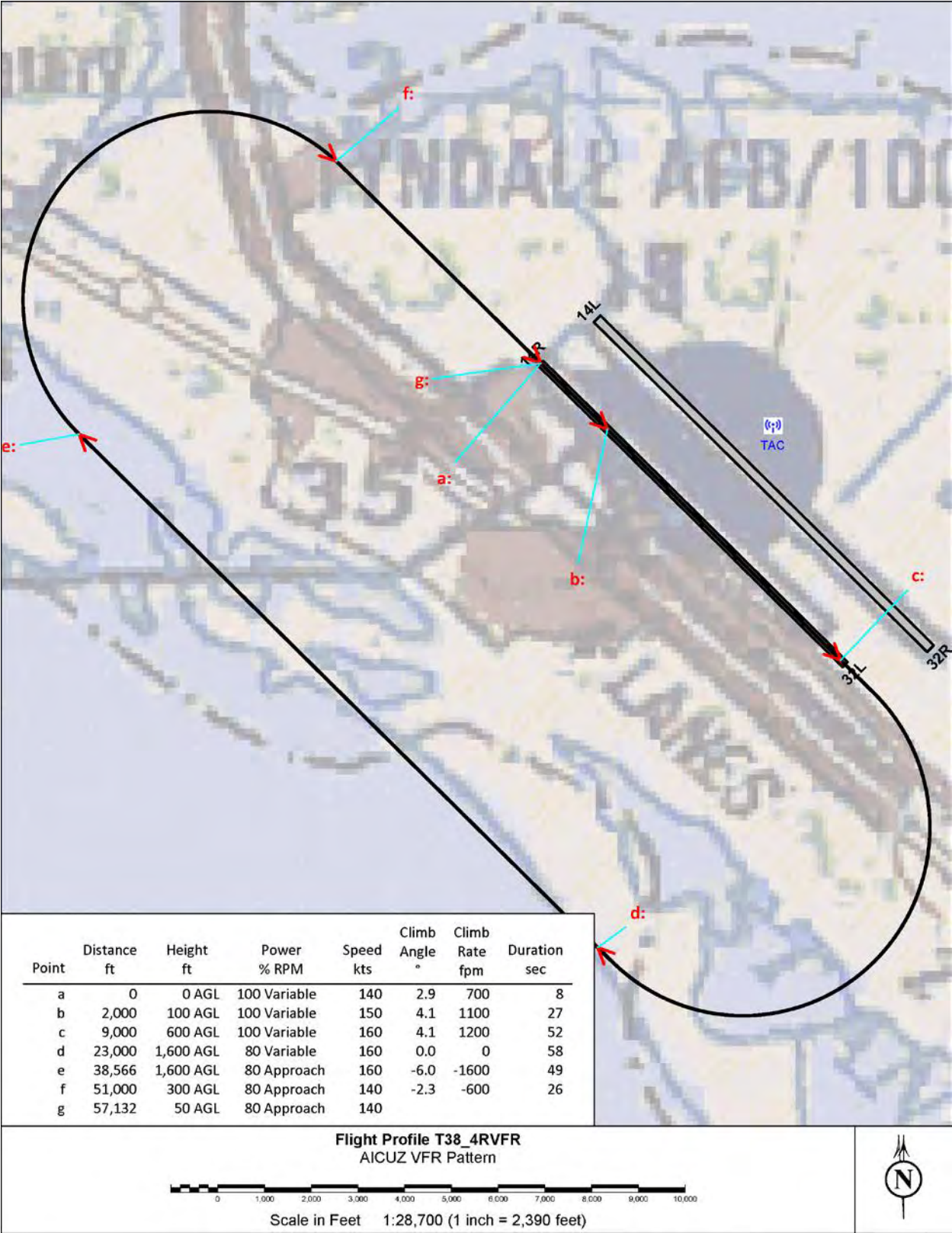


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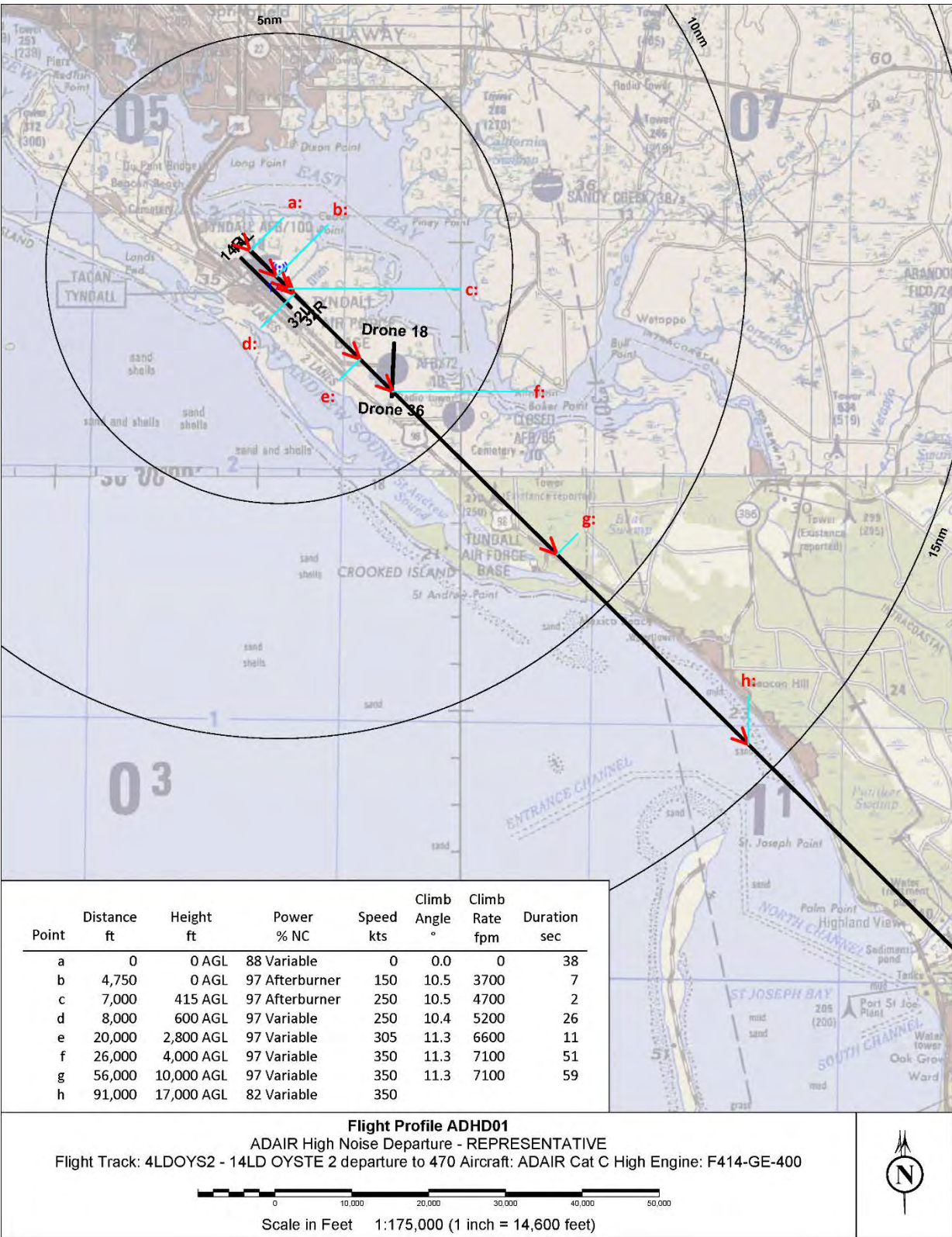


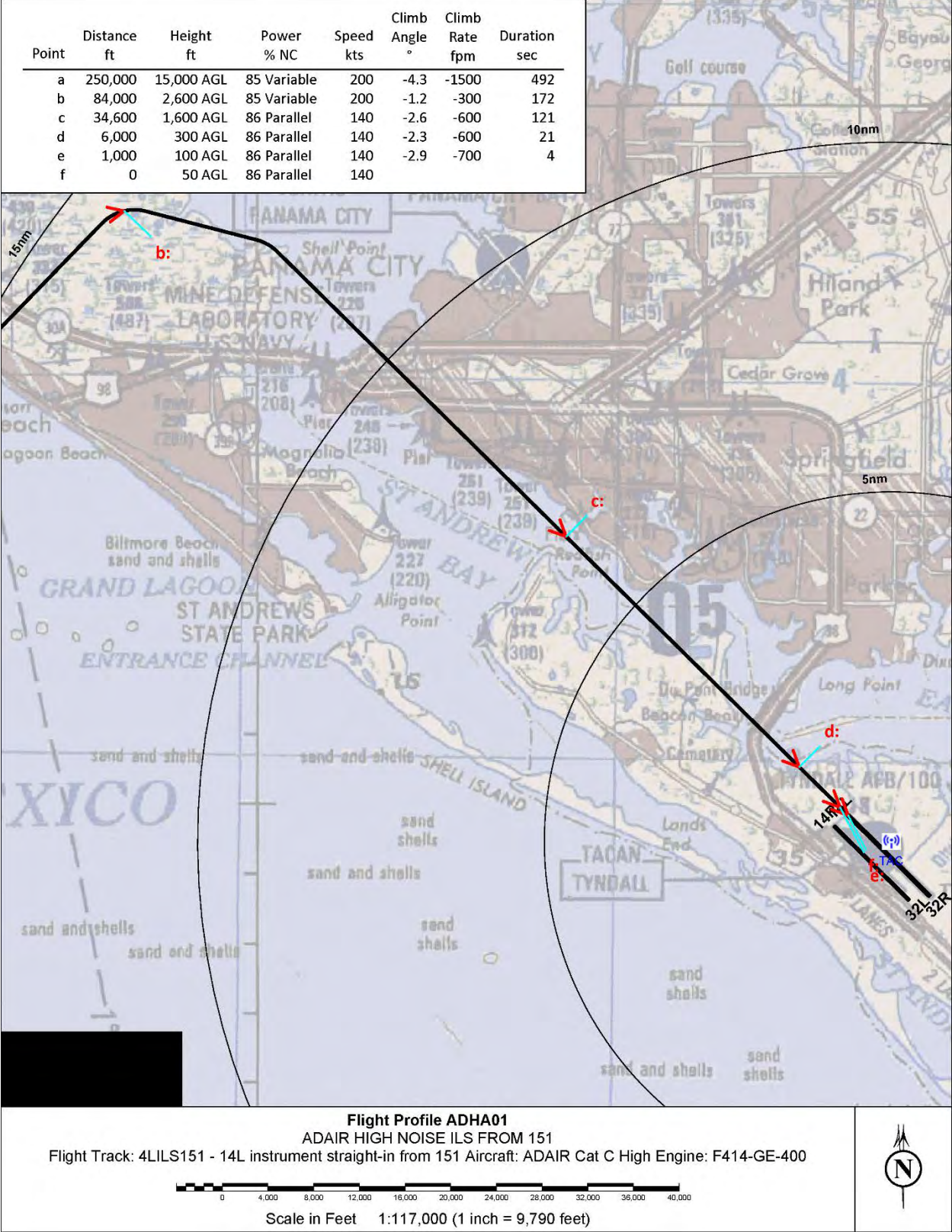


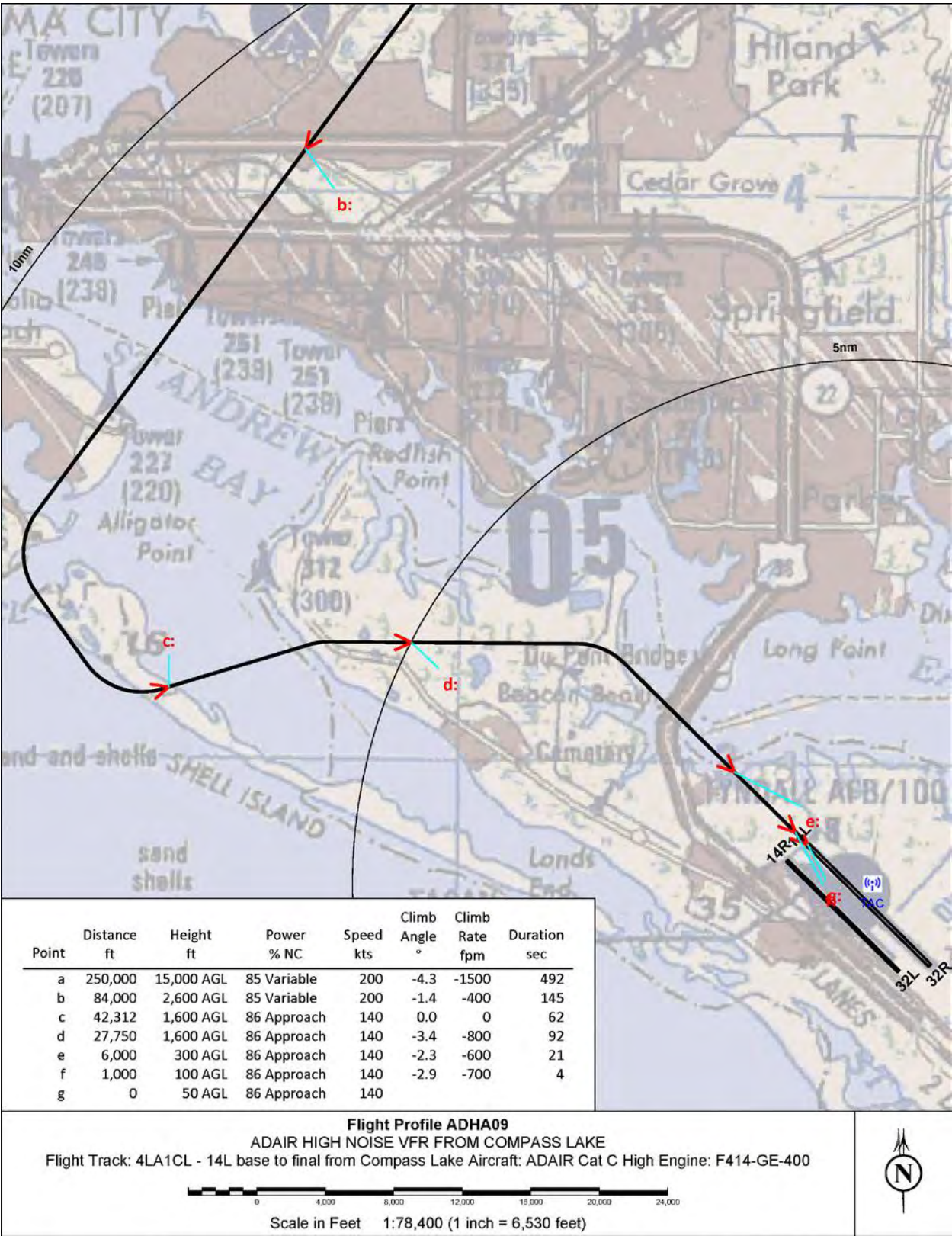


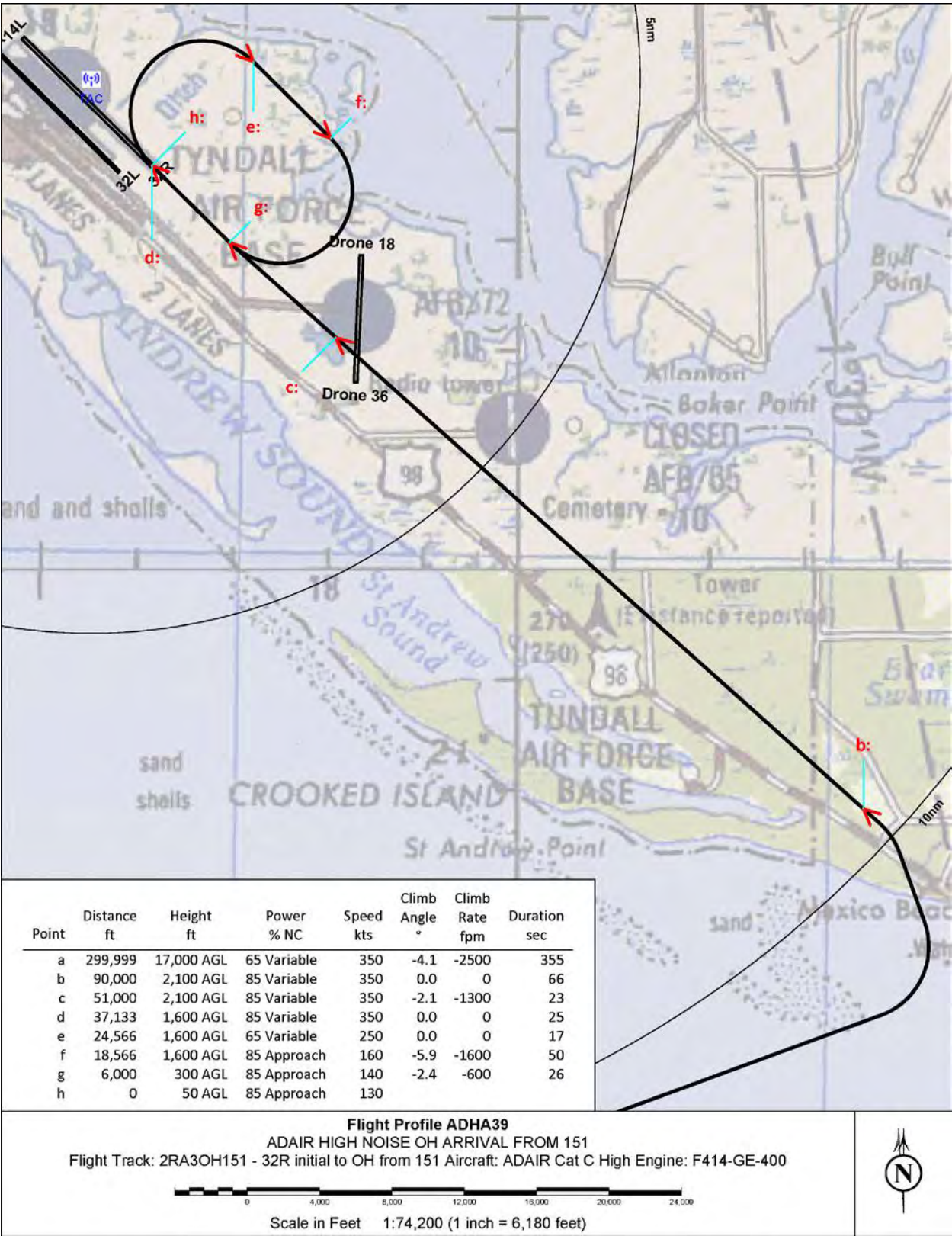
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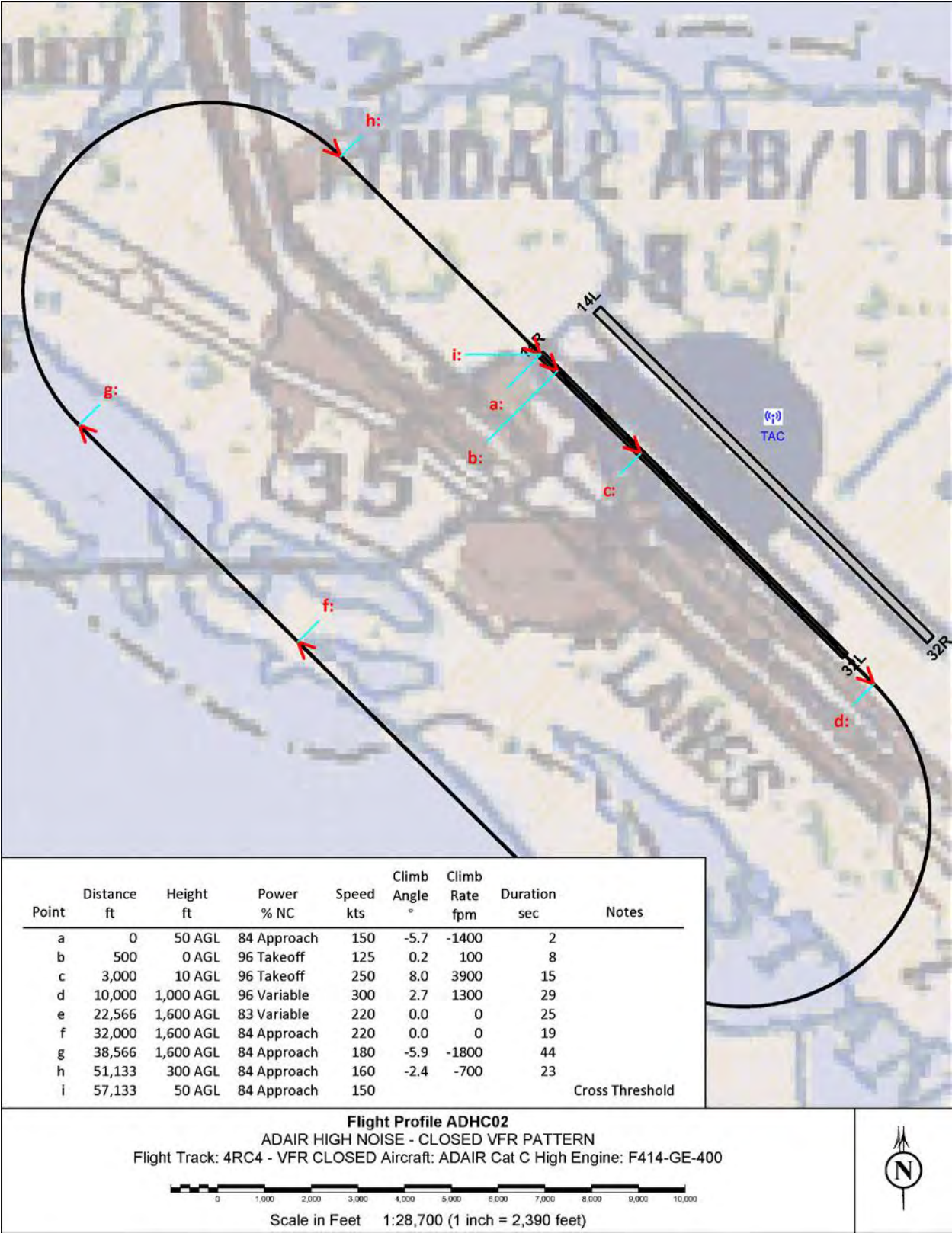
B.2.3.2 Contract ADAIR Aircraft Representative Flight Profiles  
Contract ADAIR High Noise Eurofighter Typhoon (F-18E/F Surrogate)

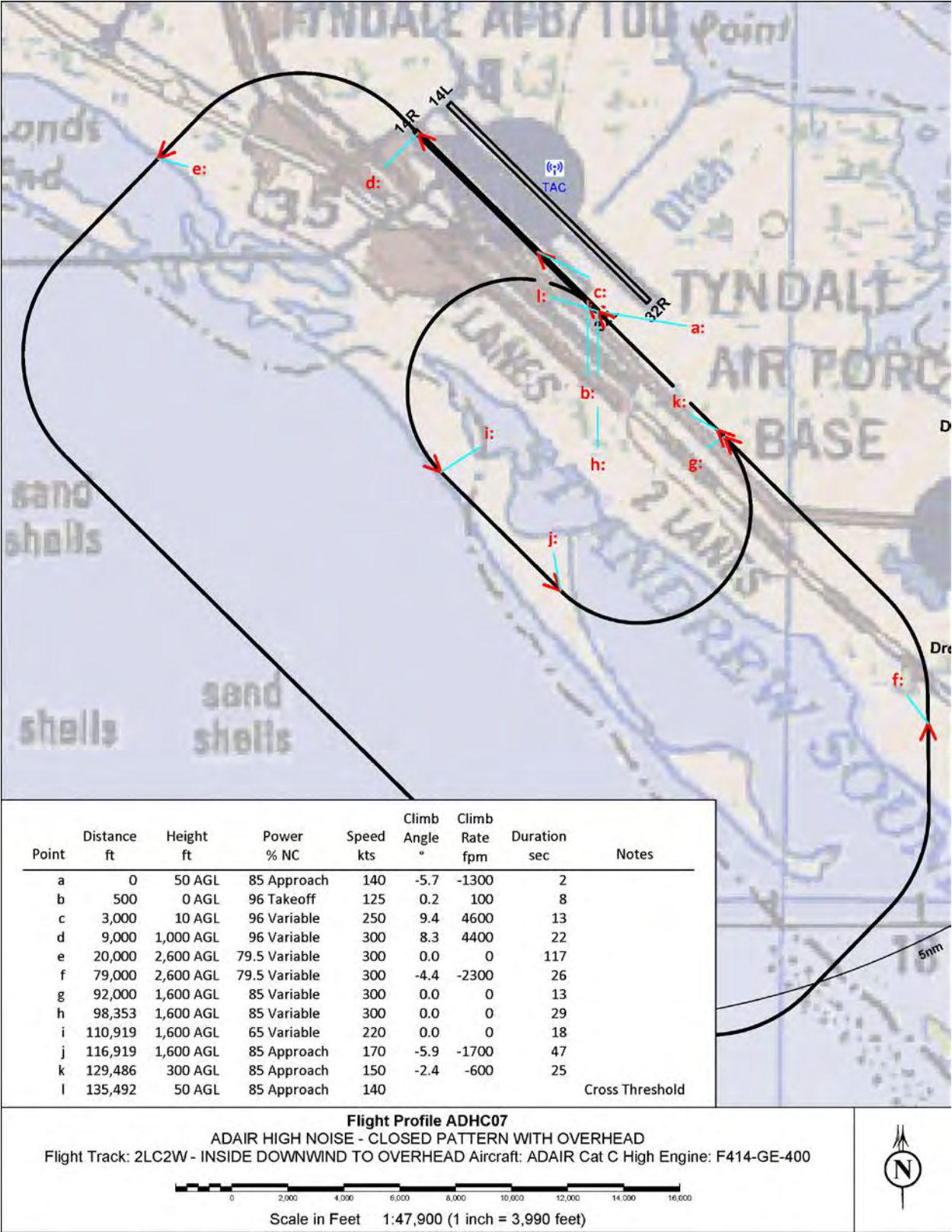






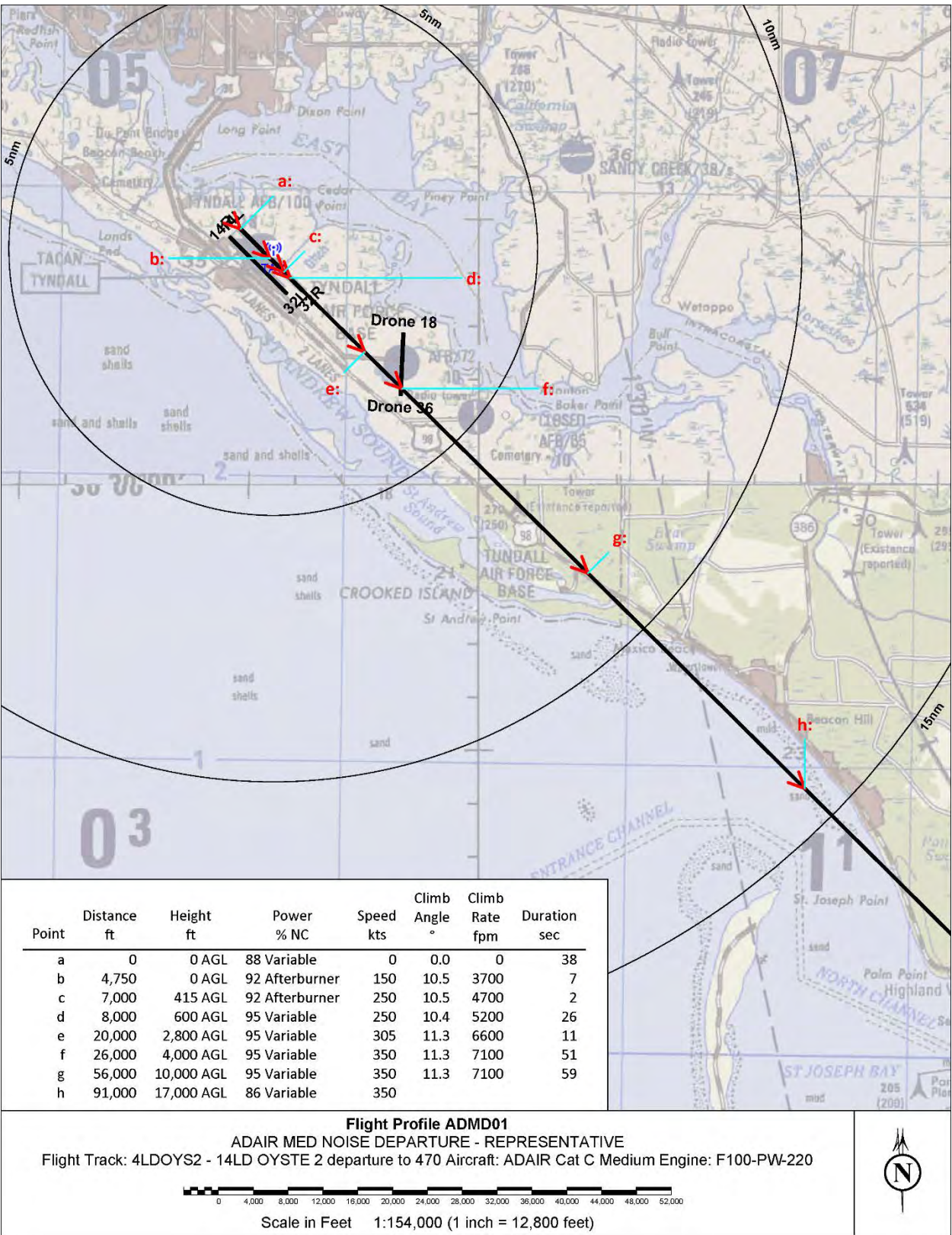






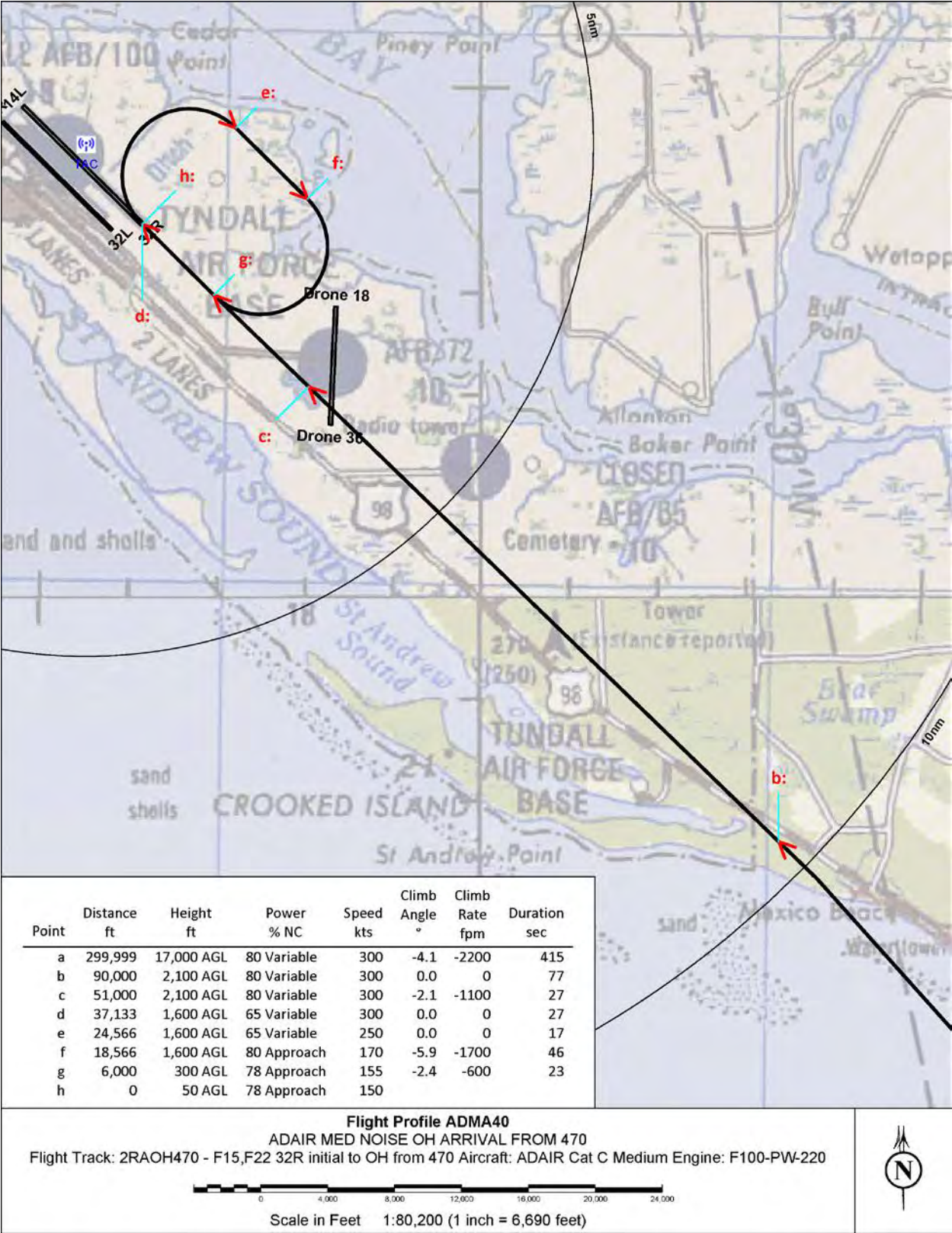
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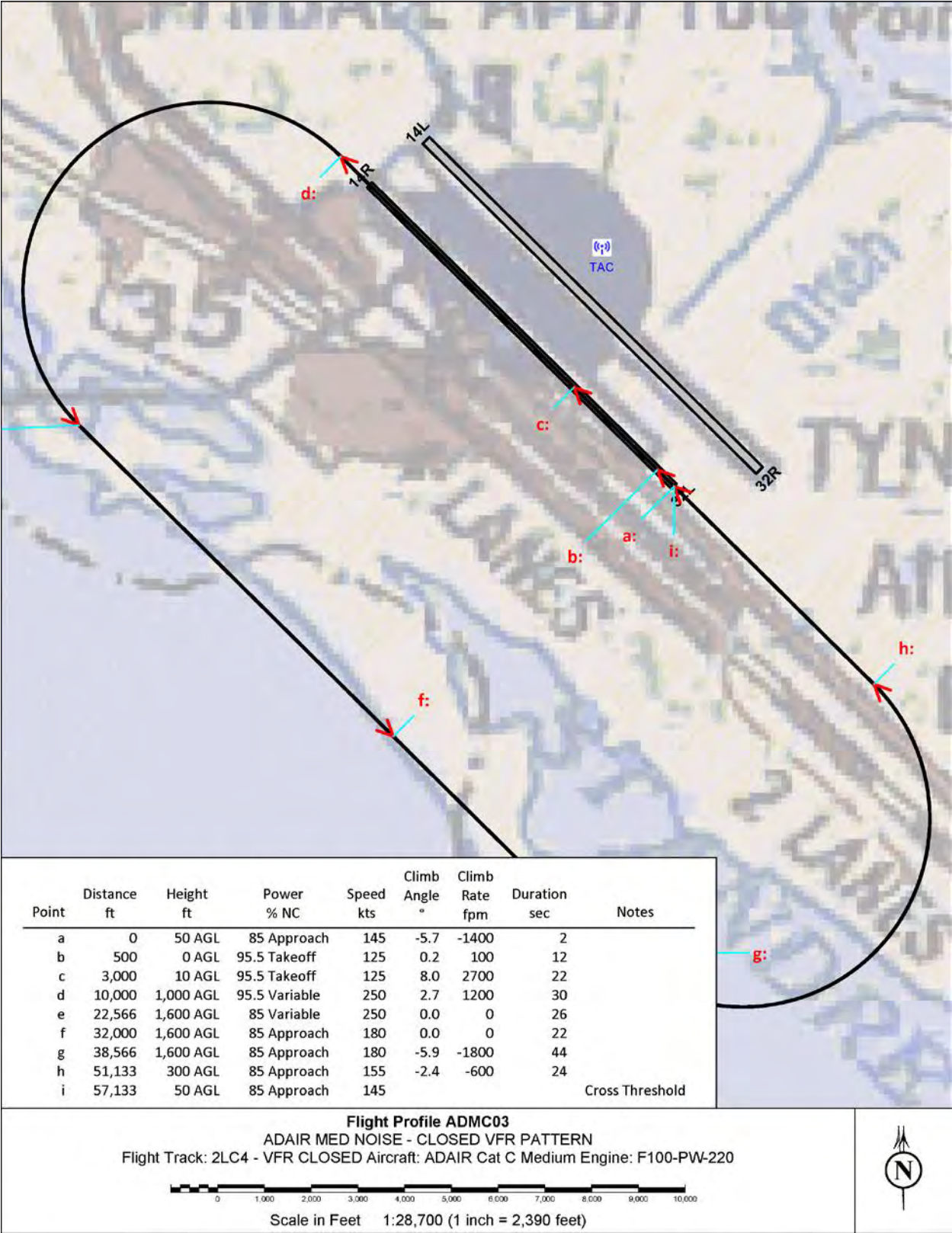
Contract ADAIR Medium Noise Dassault Mirage (F-16C Surrogate)

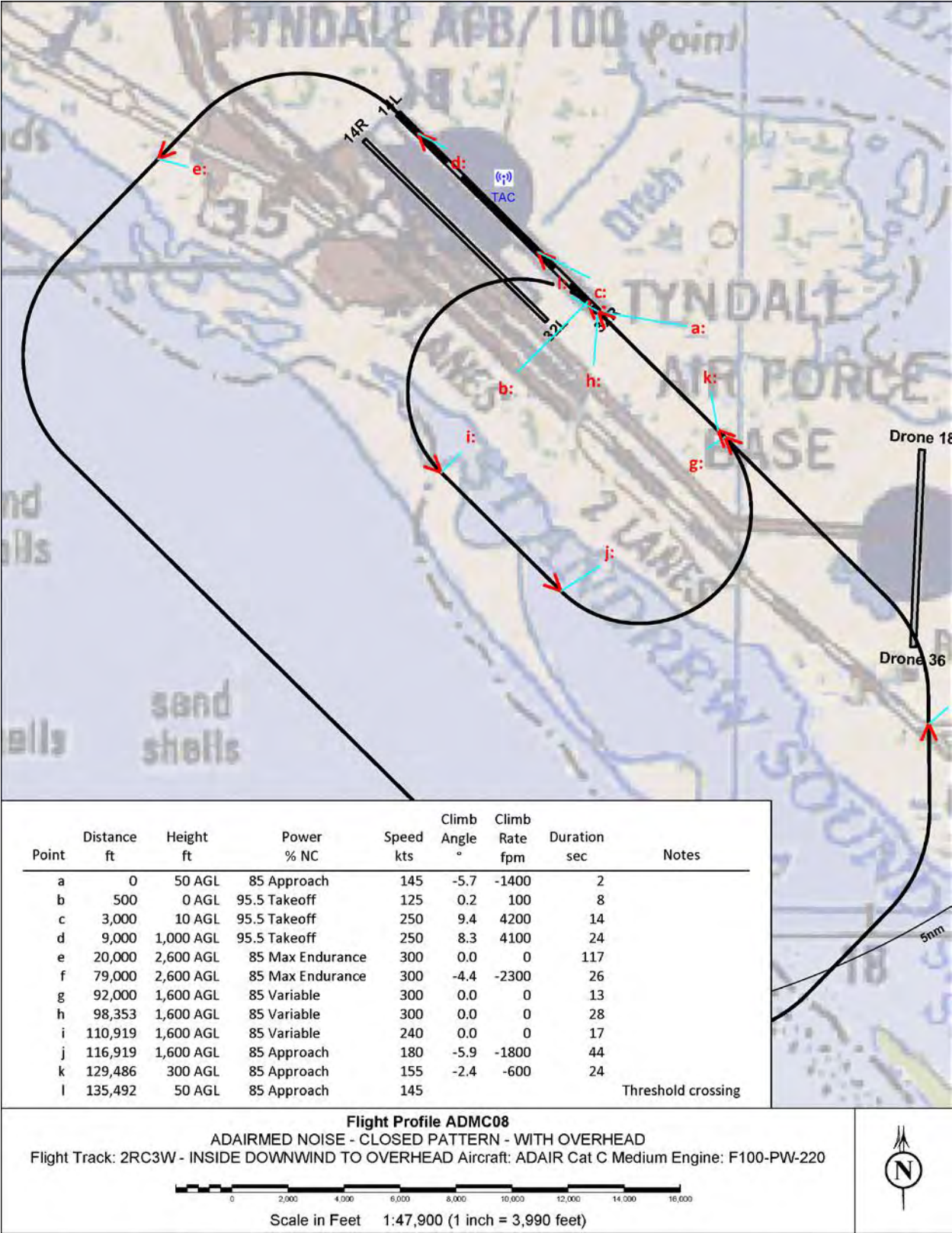






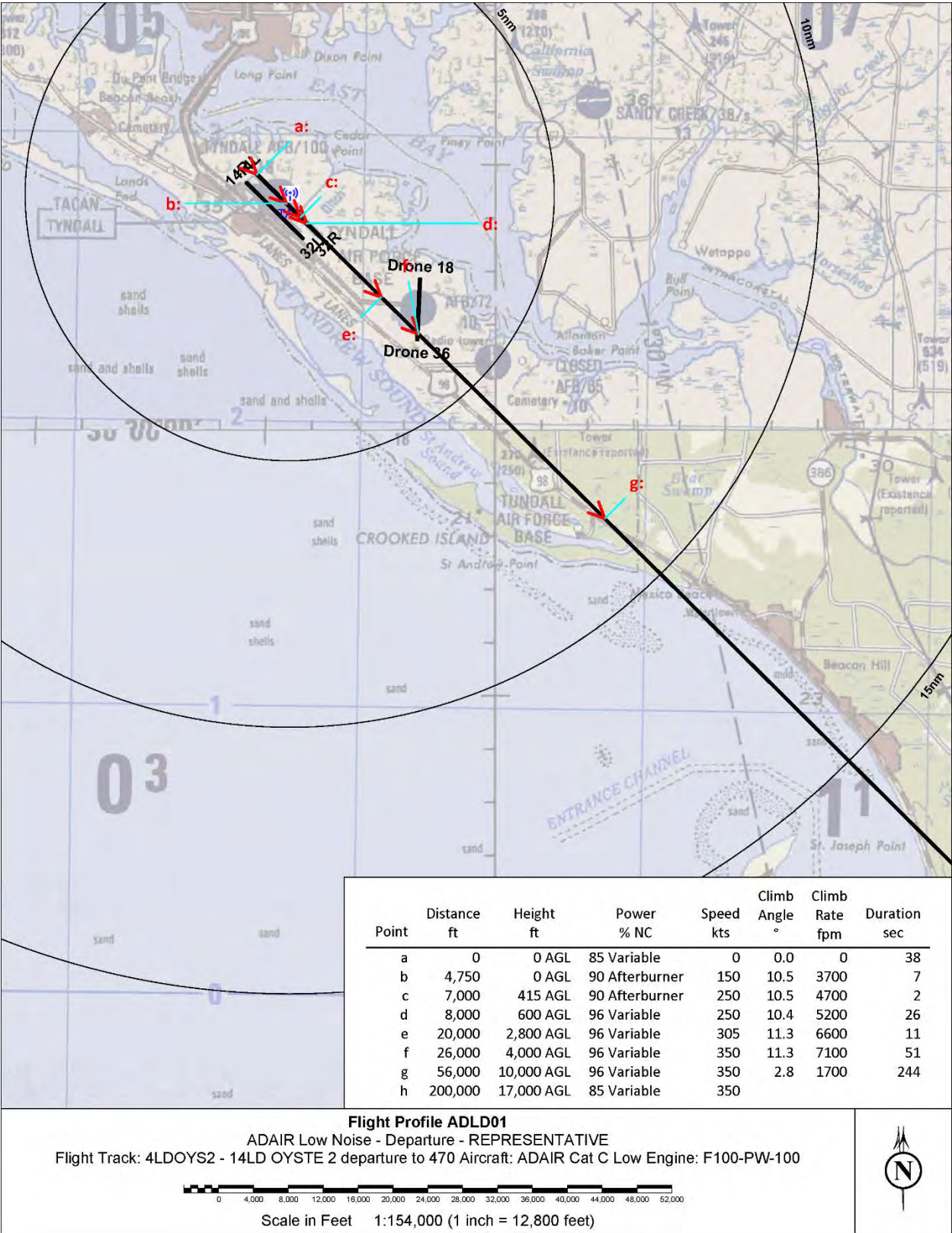


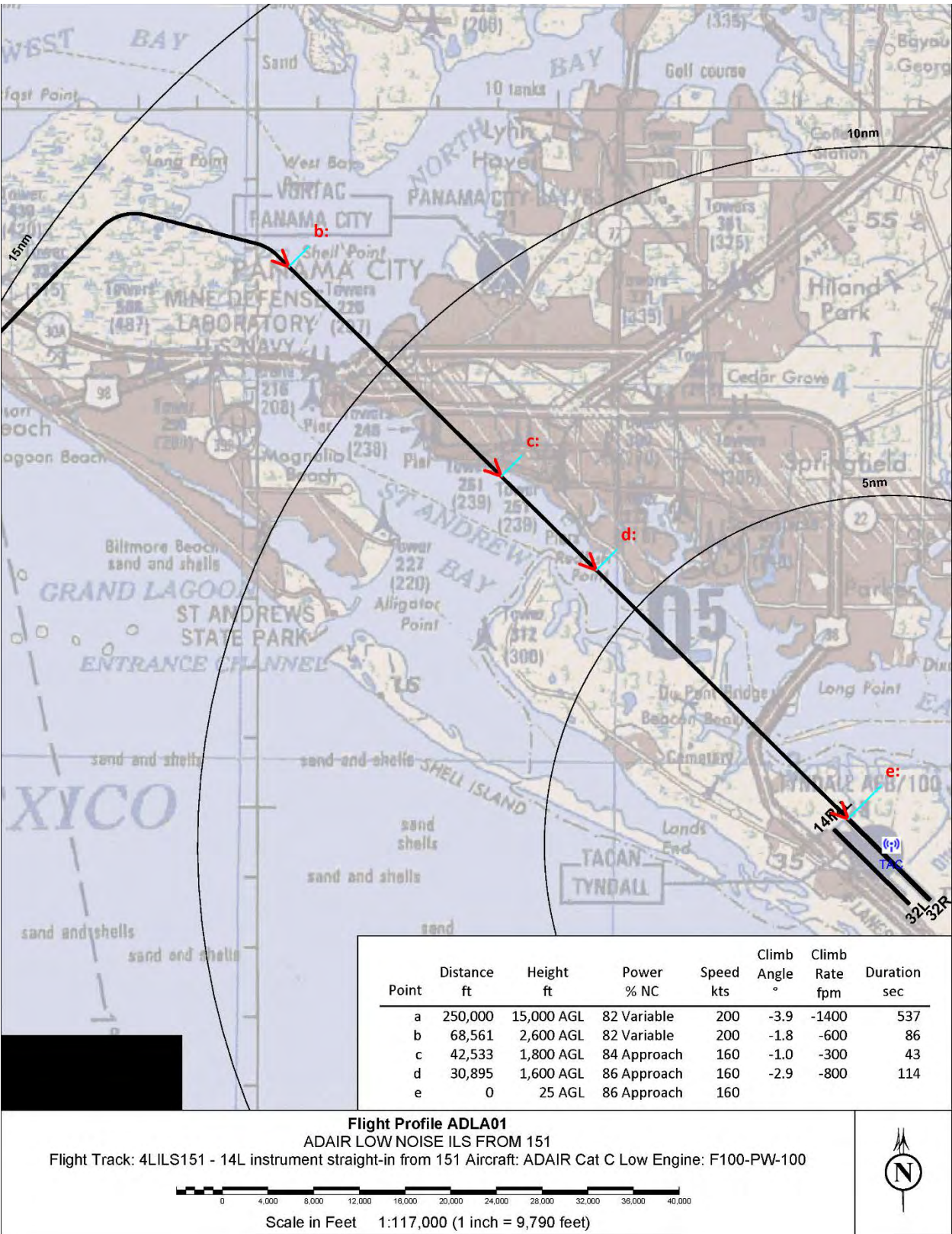




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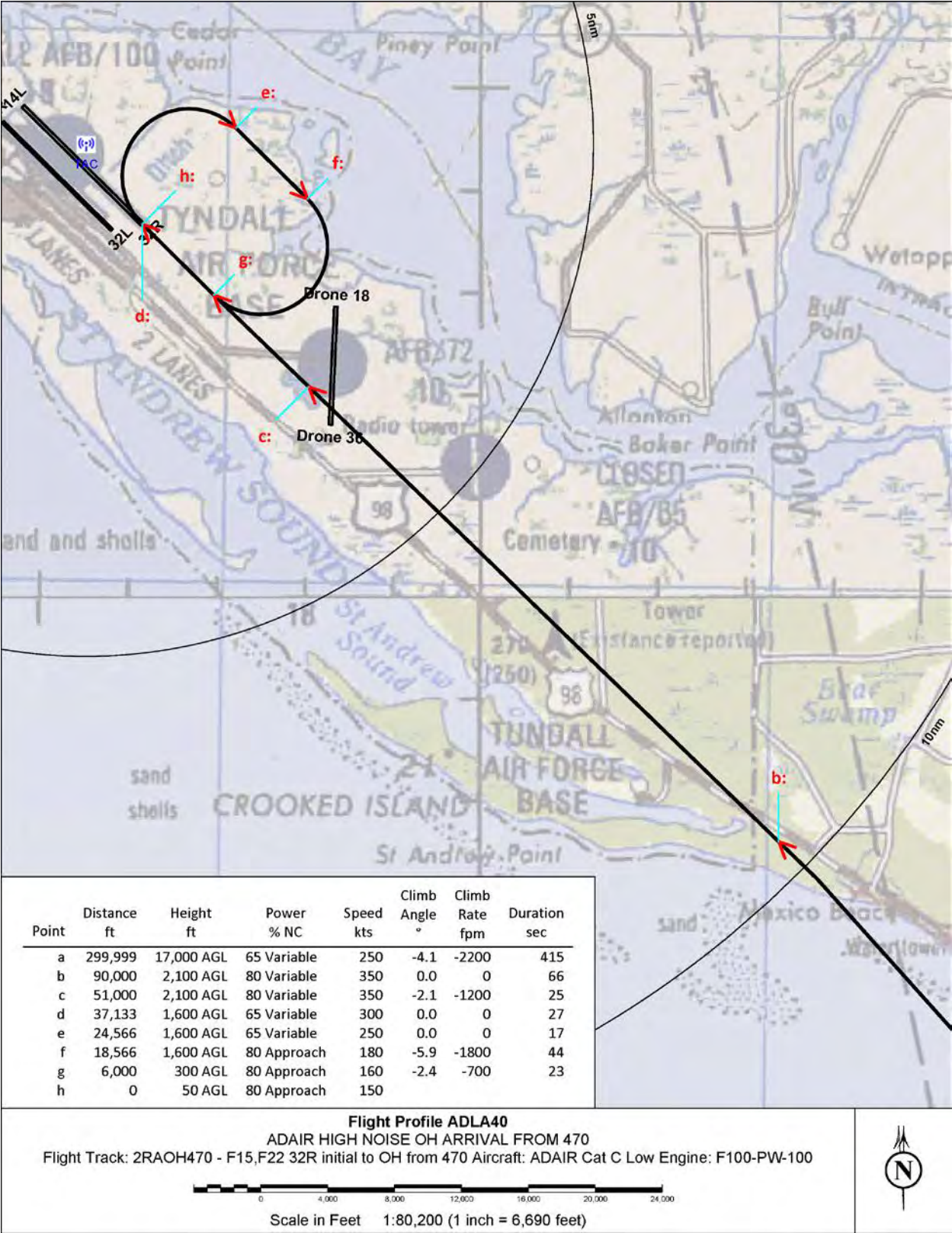
Contract ADAIR Low Noise JAS 39 Gripen (F-16A Surrogate)

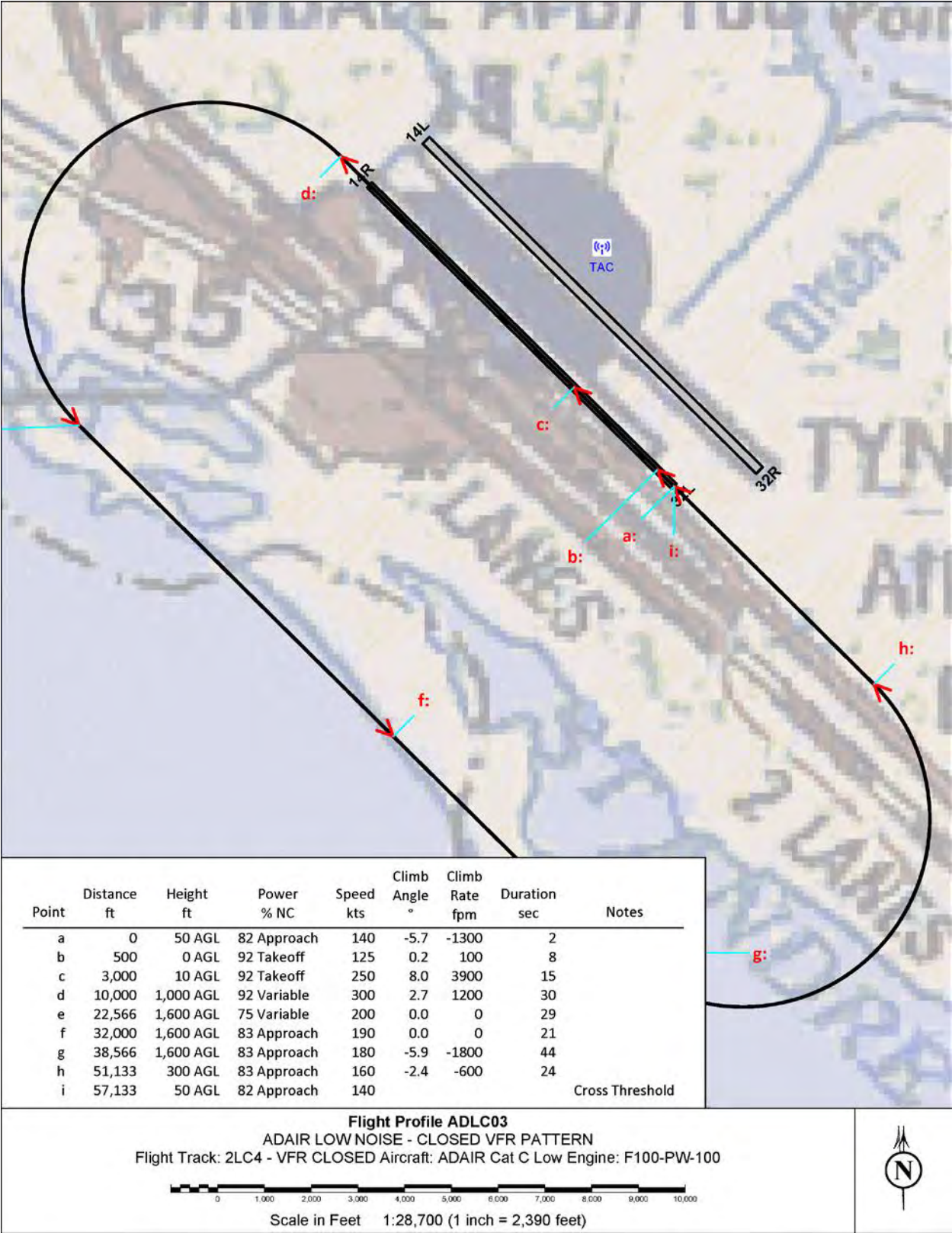


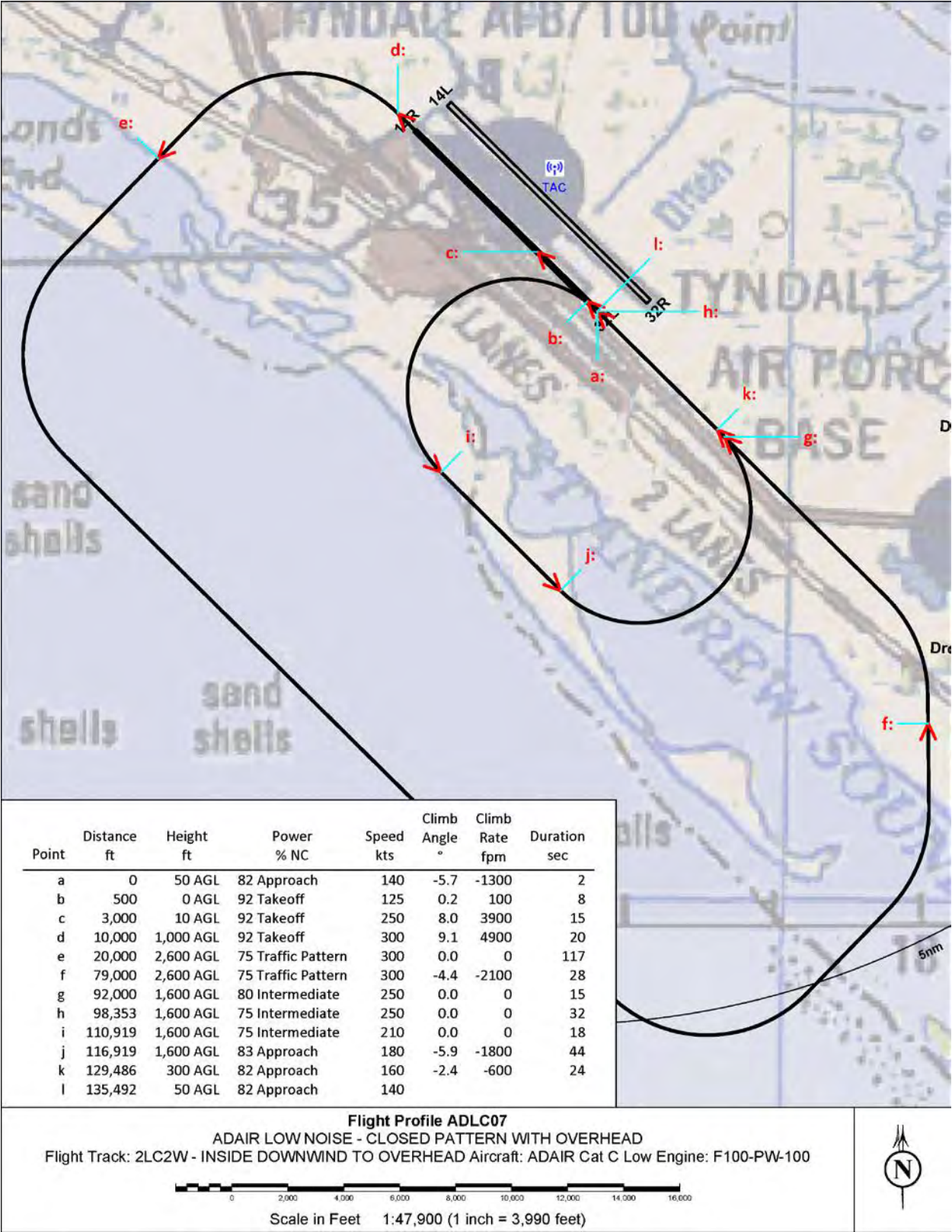


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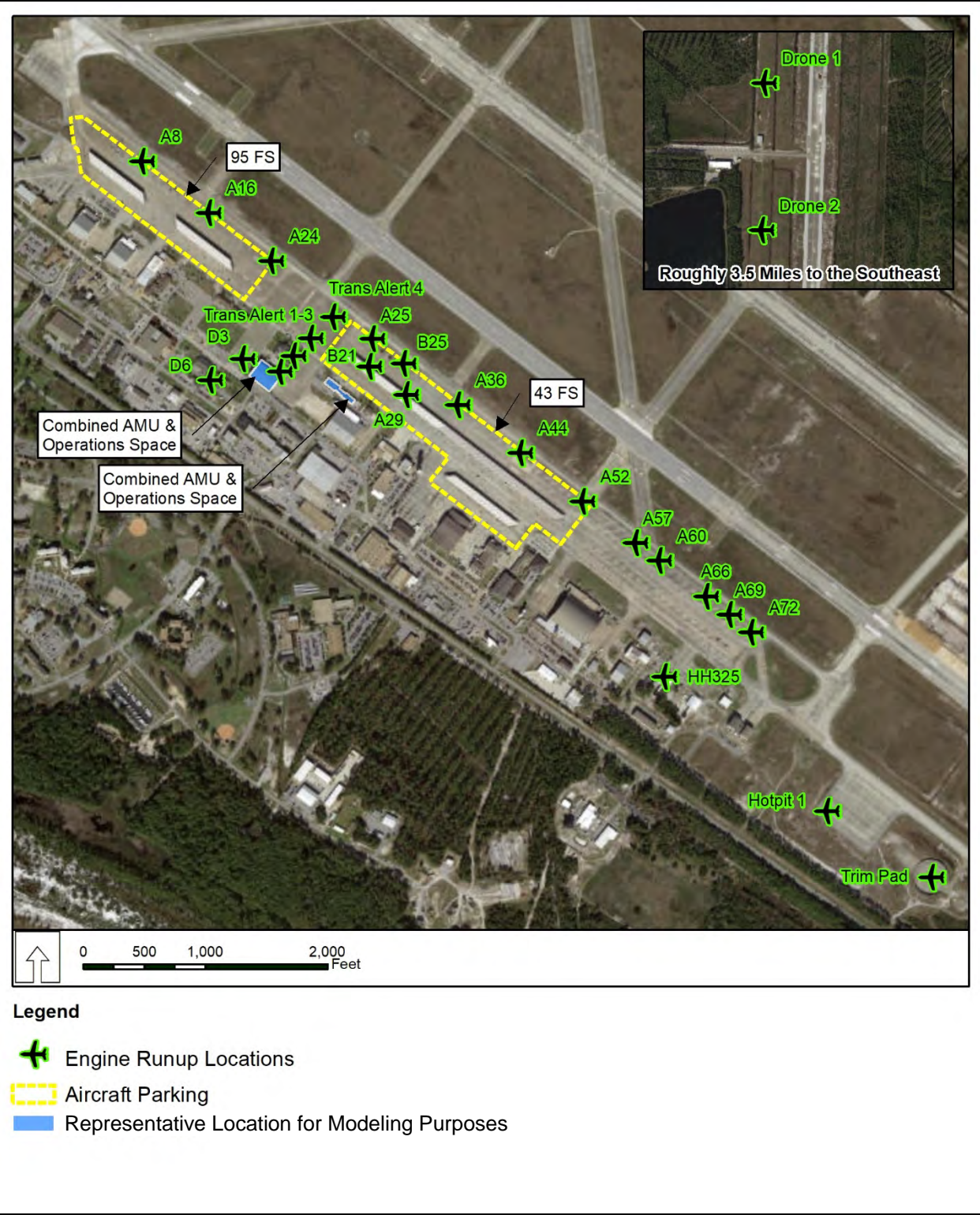




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1 **B.2.4** *Ground/Maintenance Run-ups*  
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3 This section details the number, type, and duration of the ground and maintenance engine run-up  
4 operations at the airfield. Contract ADAIR aircraft maintenance would include routine inspections and minor  
5 unscheduled repairs on the flightline. Aircraft requiring major scheduled (depot level maintenance) or  
6 unscheduled maintenance would be expected to be flown back to the contractor's home base for repairs.  
7 The only ground operations expected to increase with the addition of contract ADAIR aircraft would be the  
8 preflight run-up checks, postflight idling, and trim tests. **Figure B-16** shows the location of all the static run-  
9 up locations at Tyndall AFB prior to Hurricane Michael. For the purposes of noise modeling, representative  
10 locations for contract ADAIR aircraft parking are also noted on the figure. The locations at the ends of the  
11 runway are the locations for the arming and dearming of the F-16C aircraft. The trim pad is where trim test  
12 operations for ADAIR aircraft would be performed as well as the based aircraft. Note: the trim pad is  
13 currently not certified or rated for use. **Table B-9** details the number, type, and duration of the on-field  
14 maintenance operations.  
15



**EA for Combat Air Forces Contracted Adversary Air Forces Temporary Operations at Tyndall AFB**  
**Draft**

**Table B-9**  
**Location, Type, and Duration of Ground/Maintenance Run-Up Operations at Tyndal Air Force Base**

Aircraft Type	Run-up Type	Frequency	Annual Events	Percent Day (0700-2200)	Percent Night (2200 - 0700)	Run-up Pad ID	Power Setting	Power Units	Duration Per Event (s)	# of Engines Running Per Event
T-38	Preflight checks up to 80%	95% of all flights	5100	95%	5%	B 25, 21 A 29, 25	48	%RPM	600	2
	Preflight checks up over 80%	5% of all flights	268	91%	0.09	Trimpad	48		1800	2
	Low Power runups-2 engine	4X weekly	208	100%	0	B 25, 21 A 29, 25	92		15	2
							48		900	2
							70		300	2
							75		120	2
	Engine Wash	Every 15 flights	358	90%	10%	B 25, 21 A 29, 25	48		600	2
QF-16	Preflight checks-Main runway	50% of all flights	219	100%	0%	A 66, 69, 72	74	%NC	1200	1
	Preflight checks-Main runway	50% of all flights	219	100%	0%	Trans Alert 1,2,3	74		1200	1
	Preflight checks-Drone runway	Every flight	312	100%	0%	Drone 1,2	74		1200	1
	Engine Change	2X weekly	104	100%	0%	A 66, 72	85		120	1
							74		1200	1
E-9	Preflight checks-Main runway	Every flight	218	100%	0%	A 57, 60	380	ISHP	1200	2
F-22	Preflight checks-95FS	Every flight	3416	95%	5%	A 8, 16, 24	10	%ETR	1500	2
	Preflight checks-43FS	Every flight	4392	95%	5%	A 36, 44, 52	10		1500	2
	Leak, ops check	40X weekly	2080	95%	5%	A 8, 16, 36, 44	50		600	2
							10		1800	2

**EA for Combat Air Forces Contracted Adversary Air Forces Temporary Operations at Tyndall AFB  
Draft**

**Table B-9  
Location, Type, and Duration of Ground/Maintenance Run-Up Operations at Tyndal Air Force Base**

Aircraft Type	Run-up Type	Frequency	Annual Events	Percent Day (0700-2200)	Percent Night (2200 - 0700)	Run-up Pad ID	Power Setting	Power Units	Duration Per Event (s)	# of Engines Running Per Event
F-22	Hot Pit checks	2X weekly, 15 jets per day	1560	95%	5%	Hot Pit 1	10	%ETR	600	2
	Trouble Shooting	20X weekly	1040	95%	5%	A 8, 16, 36, 44	50		480	2
							10		480	2
							10		960	2
	Acceptance Run	100X annually	100	100%	0%	HH 325	68		1200	1
							82		900	1
							92 (A/B)		300	1
							80		600	1
	Core operations	6X monthly	72	100%	0%	HH 325	80		1200	1
							88		900	1
							90		300	1
							80		600	1
	Functional Operations	8X monthly	96	100%	0%	HH 325	68		480	1
							88		180	1
							90		180	1
MU-2	Pre-flight checks	Every flight	1952	100%	0%	D 3,6	65	%NC	300	2
	Post-flight cooldown	Every flight	1952	100%	0%	D 3,6	65		180	2
	MX on pads	50X annually	50	100%	0%	D 3,6	100		300	2
F-35A	Pre-flight checks	Every departure	6	100%	0%	Trans Alert 3,4	75	%ETR	1200	1
	Post-flight cooldown	Every arrival	6	100%	0%	Trans Alert 3,4	75		600	1
F-16	Pre-flight checks	Every departure	200	100%	0%	Trans Alert 1,2	74	%NC	1200	1
	Post-flight cooldown	Every arrival	200	100%	0%	Trans Alert 1,2	74		1200	1

**Table B-9**  
**Location, Type, and Duration of Ground/Maintenance Run-Up Operations at Tyndal Air Force Base**

Aircraft Type	Run-up Type	Frequency	Annual Events	Percent Day (0700-2200)	Percent Night (2200 - 0700)	Run-up Pad ID	Power Setting	Power Units	Duration Per Event (s)	# of Engines Running Per Event
F-18	Pre-flight checks	Every departure	55	100%	0%	Trans Alert 3,4	65	%NC	1200	2
	Post-flight cooldown	Every arrival	55	100%	0%	Trans Alert 3,4	65		600	2
F-15	Pre-flight checks	Every departure	270	100%	0%	Trans Alert 1,2	63	%NC	1200	2
	Post-flight cooldown	Every arrival	270	100%	0%	Trans Alert 1,2	63		600	2
C-21A	Pre-flight checks	Every departure	47	100%	0%	Trans Alert 1,2	60	%NC	1200	2
	Post-flight cooldown	Every arrival	47	100%	0%	Trans Alert 1,2	60		1200	2
ADAIR Category C	Pre/Post flight check/cooldown	Every flight	3400	99%	1%	ADAIR parking	Idle	-	1200	All
	Trim <sup>1</sup>	24 tests/year/ aircraft	336	100%	0%	Trimpad	Idle	-	720	1
							Approach		1620	
							Intermediate		540	
							Military		540	
							Afterburner		180	

Notes:

(0) Annual events rounded to the nearest integer for clarity. Noise modeling will use fractional event numbers.

(1) ACAM defaults assumed for ADAIR aircraft. Expecting 12 ADAIR aircraft.

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**APPENDIX C**  
**AIR QUALITY**

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**Appendix C-1**

**Air Conformity Applicability Analysis**

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## C.1 AIR QUALITY

This appendix presents an overview of the Clean Air Act (CAA) and the state of Florida air quality regulations. It also presents calculations, including the assumptions used for the air quality analyses presented in the Air Quality sections of this Environmental Assessment.

### C.1.1 Air Quality Program Overview

To protect public health and welfare, the United States Environmental Protection Agency (USEPA) has developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for six “criteria” pollutants (based on health-related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (40 Code of Federal Regulations [CFR] Part 50).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Florida Division of Air Resources Management oversees the state's air pollution control program under the authority of the federal CAA and amendments, federal regulations, and state laws. Florida has adopted the federal NAAQS (Florida Administrative Code 62-204.800). These standards are shown in **Table C-1**.

Florida operates and maintains an ambient air monitoring network that follows the USEPA protocols and quality assurance/control procedures. Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than (attainment) the NAAQS, worse than (nonattainment) the NAAQS, and unclassifiable. The areas that cannot be classified (on the basis of available information) as meeting or not meeting the NAAQS for a particular pollutant are “unclassifiable” and are treated as attainment until proven otherwise. Attainment areas can be further classified as “maintenance” areas, which are areas previously classified as nonattainment but where air pollutant concentrations have been successfully reduced to below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS.

Section 176(c) (1) of the CAA contains legislation that ensures federal activities conform to relevant State Implementation Plans (SIPs) and thus do not hamper local efforts to control air pollution. Conformity to a SIP is defined as conformity to a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. As such, a general conformity analysis is required for areas of nonattainment or maintenance where a federal action is proposed.

The action can be shown to conform by demonstrating that the total direct and indirect emissions are below the *de minimis* levels (**Table C-2**), and/or showing that the proposed action emissions are within the state- or tribe-approved budget of the facility as part of the SIP or Tribal Implementation Plan (USEPA, 2010).

Direct emissions are those that occur as a direct result of the action. For example, emissions from new equipment that are a permanent component of the completed action (e.g., boilers, heaters, generators, paint booths) are considered direct emissions. Indirect emissions are those that occur at a later time or at a distance from the proposed action. For example, increased vehicular/commuter traffic because of the action is considered an indirect emission. Construction emissions must also be considered. For example, the emissions from vehicles and equipment used to clear and grade building sites, build new buildings, and construct new roads must be evaluated. These types of emissions are considered direct.

Table C-1  
National Ambient Air Quality Standards

Pollutant	Standard Value <sup>6</sup>		Standard Type
Carbon Monoxide (CO)			
8-hour average	9 ppm	(10 mg/m³)	Primary
1-hour average	35 ppm	(40 mg/m³)	Primary
Nitrogen Dioxide (NO <sub>2</sub> )			
Annual arithmetic mean	0.053 ppm	(100 µg/m³)	Primary and Secondary
1-hour average <sup>1</sup>	0.100 ppm	(188 µg/m³)	Primary
Ozone (O <sub>3</sub> )			
8-hour average <sup>2</sup>	0.070 ppm	(137 µg/m³)	Primary and Secondary
Lead (Pb)			
3-month average <sup>3</sup>		0.15 µg/m³	Primary and Secondary
Particulate <10 Micrometers (PM <sub>10</sub> )			
24-hour average <sup>4</sup>		150 µg/m³	Primary and Secondary
Particulate <2.5 Micrometers (PM <sub>2.5</sub> )			
Annual arithmetic mean <sup>4</sup>		12 µg/m³	Primary
Annual arithmetic mean <sup>4</sup>		15 µg/m³	Secondary
24-hour average <sup>4</sup>		35 µg/m³	Primary and Secondary
Sulfur Dioxide (SO <sub>2</sub> )			
1-hour average <sup>5</sup>	0.075 ppm	(196 µg/m³)	Primary
3-hour average <sup>5</sup>	0.5 ppm	(1,300 µg/m³)	Secondary

Source: USEPA, 2016

Notes:

- 1 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.
  - 2 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.
  - 3 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.
  - 4 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>.
  - 5 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.
  - 6 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

**Table C-2**  
**General Conformity Rule *De minimis* Emission Thresholds**

Pollutant	Attainment Classification	Tons per year
Ozone (VOC and NO <sub>x</sub> )	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO <sub>x</sub> )	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon Monoxide, SO <sub>2</sub> and NO <sub>2</sub>	All nonattainment and maintenance	100
PM <sub>10</sub>	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
PM <sub>2.5</sub> Direct emissions, SO <sub>2</sub> , NO <sub>x</sub> (unless determined not to be a significant precursor), VOC and ammonia (if determined to be significant precursors)	All nonattainment and maintenance	100
Lead	All nonattainment and maintenance	25

Source: USEPA, 2017

NO<sub>2</sub> = nitrogen dioxide; 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

Each state is required to develop a SIP that sets forth how CAA provisions will be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds; that is, 100 or 250 tons/year based on the source's industrial category. These thresholds are applicable to stationary sources. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. **Table C-3** provides a tabular listing of the PSD significant emissions rate thresholds for selected criteria pollutants (USEPA, 1990). Air quality modeling analysis for a PSD proposed facility is required to demonstrate that its emissions of specific pollutants will not cause or significantly contribute to a violation of any ambient air quality standard.

**Table C-3**  
**Criteria Pollutant Significant Emissions Rate Increases Under Prevention of Significant Deterioration Regulations**

Pollutant	Significant Emission Rate (ton/year)
PM <sub>10</sub>	15
PM <sub>2.5</sub>	10
TSP	25
SO <sub>2</sub>	40
NO <sub>x</sub>	40
Ozone (VOCs)	40
CO	100

Source: Title 40 Code of Federal Regulations Part 52 Subpart A, §52.21

Notes:

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; TSP = total suspended particulate; VOC = volatile organic compound

The goals of the PSD program are to (1) ensure economic growth while preserving existing air quality; (2) protect public health and welfare from adverse effects that might occur even at pollutant levels better than the NAAQS; and (3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using Best Available Control Technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in **Table C-4**. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. There are no Class I areas near the Tyndall Air Force Base (AFB).

**Table C-4**  
**Federal Allowable Pollutant Concentration Increases Under Prevention of Significant Deterioration Regulations**

Pollutant	Averaging Time	Maximum Allowable Concentration (µg/m <sup>3</sup> )		
		Class I	Class II	Class III
PM <sub>2.5</sub>	Annual	1	4	8
	24-hour	2	9	18
PM <sub>10</sub>	Annual	4	17	34
	24-hour	8	30	60
SO <sub>2</sub>	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO <sub>2</sub>	Annual	2.5	25	50

Source: Title 40 Code of Federal Regulations Part 52 Subpart A, §52.21

Notes:

µg/m<sup>3</sup> = microgram(s) per cubic meter; 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

1 The Air Quality Monitoring Program monitors ambient air throughout the state. The purpose is to monitor,  
2 assess, and provide information on statewide ambient air quality conditions and trends as specified by the  
3 state and federal CAA. The Air Quality Monitoring Program works in conjunction with local air pollution  
4 agencies and some industries, measuring air quality throughout the states.  
5

6 The air quality monitoring network is used to identify areas where the ambient air quality standards are  
7 being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the  
8 standards. Also included are areas where the ambient standards are being met, but plans are necessary  
9 to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial  
10 growth.  
11

12 The result of this attainment/maintenance analysis is the development of local and statewide strategies for  
13 controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this  
14 process is the annual compilation of the ambient air monitoring results, and the second step is the analysis  
15 of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.  
16

### 17 *C.1.2 Assumptions*

18  
19 The following are assumptions were used in the air quality analysis for the proposed and alternative actions:  
20

- 21 1. No construction (or negligible construction) would be associated with the Proposed Action. This  
22 includes no demolition, earth moving, hauling, or paving. Some minor interior building fabrication  
23 would be possible but affected square footage is too small to result in outdoor air quality impacts.  
24 This may include upgrade to fire suppression/life support systems.
- 25 2. No installation of new boilers or generators. No generators would be used for the Proposed Action.
- 26 3. No new storage tanks would be installed; additional Jet A fuel needed by contractor aircraft would  
27 be calculated based on engine type, number of sorties, and engine fuel consumption rate.
- 28 4. Air Force personnel would deliver fuel to the contractor at the airfield using tank trucks. Gas and  
29 diesel/Jet A fuel for the contractor's aerospace ground equipment (AGE) and flight line special  
30 purpose vehicles would be obtained by contract adversary air (ADAIR) personnel from the base  
31 military service station.
- 32 5. Chaff and flares to be used by contractor would be stored using current facilities (additional/new  
33 ammunition storage facilities not needed).
- 34 6. No new Hush House/Engine Test Cell facilities would be installed and existing Hush House/Engine  
35 Test Cell facilities would not be used for ADAIR contractor aircraft.
- 36 7. No new paint booth facilities would be installed, and existing paint booths would not be used for  
37 ADAIR contract aircraft.
- 38 8. Contractor may bring their own parts cleaner (or share already installed unit unknown at this time)  
39 - for either case it is assumed contractor use would be minimal - (no more than 0.5 gallon/month  
40 solvent used/lost).
- 41 9. Maintenance for contractor aircraft would be limited to minor repairs and minor routine  
42 maintenance/inspections (significant repairs, schedule/phased maintenance and inspections to  
43 be conducted off-site).
- 44 10. While ADAIR targeted performance is estimated to start in September 2020 with up to a 10-year  
45 period of performance, the emissions were estimated for each year of the Proposed Action  
46 beginning in June 2020 and ending in May 2030. For air quality modeling purposes, these are  
47 representative years; the modeling generates air emissions estimates for the life of a  
48 representative 10-year contract. A full year is a reference year and partial years (start and end  
49 year) may be determined by dividing by the number of months estimated for that year.
- 50 11. Contractor aircraft takeoff and landing cycles - use/assume Air Conformity Applicability Model  
51 (ACAM) default "times in mode" to be conservative.
- 52 12. Assume once an aircraft is out of the landing and take-off (LTO) cycle the time spent traveling  
53 to/from the special use airspace (5 to 20 minutes) would be at an altitude above 3,000 feet (ft).  
54 13. Assume mixing height is 3,000 ft, which matches USEPA and Air Force Guidance.

- 1 14. Air Force training sorties would not increase or decrease as result of this action. Roles may change  
2 (i.e., the Air Force no longer need to play the adversary, but this would not change in any  
3 substantial way the number of Air Force sorties flown); thus, the change (increase) in emissions  
4 for air operations would be strictly due to the addition of the contract ADAIR aircraft and  
5 associated ground and maintenance activities.
- 6 15. Assume the number of transient aircraft utilizing the airfield would not increase or decrease as a  
7 direct result of contract ADAIR.
- 8 16. Air Force use of engine test cells/hush house would not change as a result of the Proposed Action.  
9 No changes to Air Force trim tests also assumed.
- 10 17. For contactor AGE and auxiliary power units (APUs) - until the contractor is selected, what they  
11 would bring/use in terms of AGE and APUs is unknown, thus ACAM defaults will be used based  
12 on the surrogate aircraft and engine type.
- 13 18. Assume contract aircraft would engage in LTO cycles, and touch and go (TGO) or low-approach  
14 activities only in the vicinity of the airfield.
- 15 19. Assume 5 percent of on-airfield daytime sorties (120 of 2,400 sorties) would include multiple  
16 patterns for contractor proficiency.
- 17 20. It is unknown what contractor requirements would be for trim tests; thus, ACAM defaults will be  
18 assumed based on surrogate aircraft and engine type.
- 19 21. Assume all new ADAIR contractor personnel (pilots and maintenance staff) would live off-base and  
20 commute to the base 5 days per week. ACAM defaults will be used for commute distances.
- 21 22. All contract ADAIR training sorties would utilize chaff and flares (as described in Chaff/Flare  
22 Allocations V5). Only RR-196T chaff and M206 flares, or equivalent, would be utilized (no other  
23 materials will be considered in the analysis). Chaff and flares would only be used in all the special  
24 use airspace except Tyndall C MOA.
- 25 23. Assume air quality impacts from chaff releases under actual flight conditions would be low and  
26 would have negligible impact on the particulate matter with a diameter of less than 10 and 2.5  
27 micrometers NAAQS (Air Force, 1997); thus, only the use of flares and impulse cartridges (if  
28 applicable) used at or below 3,000 ft will be considered in the air quality analysis. It is assumed  
29 flares used above 3,000 ft would disperse and not affect air quality in the lowest 3,000 ft above  
30 ground level (AGL). While contract ADAIR aircraft would employ M206 flares or similar during  
31 training sortie operations within the Warning Areas and Tyndall B, E, and H MOAs, only the  
32 Warning Areas allow their use at or below 3,000 ft altitude. As a result, flare emissions are only  
33 included in the air quality analysis for W-151 and W-470.
- 34 24. For the High Emission Scenario, the surrogate for the MIG-29 is the F15 A/BC/D with engine model  
35 F100-PW-100.
- 36 25. For the Medium Emission Scenario, the surrogate for the Mirage is the F16 C/D with engine model  
37 F110-GE-100.
- 38 26. For the Low Emission Scenario, the aircraft is F5A/F5B with engine model J85-GE-13.
- 39 27. All ADAIR related training at Tyndall AFB would occur in the Tyndall C, B, E, and H MOAs and  
40 Warning Areas W-151 and W-470 as designated in the description of the Proposed Action and  
41 as summarized in this appendix.
- 42 28. Contractor training/mission time in airspace would be approximately 45 to 60 minutes. Time spent  
43 at or below 3,000 ft is estimated to be approximately 8.7 minutes; see **Table C-5** in Tyndall C  
44 and E MOAs and Warning Areas W-151 and W-470.
- 45 29. ACAM does not have separate inputs for time spent within a MOA or Warning Area. To represent  
46 the time spent at or below 3,000 ft, 8.7 minutes was assigned to Climb out/Intermediate power  
47 mode within the ACAM LTO input fields. No time was assigned to any other power modes, but  
48 default ACAM output also lists trim tests and TGOs; however, all inputs for these fields were set  
49 to zero for time spent within the special use airspace (**Table C-6**).
- 50 30. Assume the time spent below 3,000 ft AGL would be the same for all sorties.
- 51 31. No changes to baseline Air Force aircraft air operations (sorties) due to contract ADAIR and no  
52 changes to transient and civilian air operations due to contract ADAIR.
- 53 32. For consideration of potential air quality impacts, it is the volume of air extending up to the mixing  
54 height (3,000 ft AGL) and coinciding with the spatial distribution of the region of influence that is  
55 considered. Pollutants that are released above the mixing height typically would not disperse  
56 downward and thus would have little or no effect on ground level concentrations of pollutants.

The mixing height is the altitude at which the lower atmosphere undergoes mechanical or turbulent mixing, producing a nearly uniform air mass. The height of the mixing level determines the volume of air within which pollutants can disperse. Mixing heights at any one location or region can vary by the season and time of day, but for air quality applications an average mixing height of 3,000 ft AGL is an acceptable default value (40 CFR § 93.153[c][2]). Although the proposed ADAIR training is projected to occur within multiple MOAs and Warning Areas only those with training at or below 3,000 ft AGL are a concern with respect to potential air quality impacts.

33. **Tables C-5 and C-6** below show the data and assumptions used as input to ACAM for flight operations.

**Table C-5**  
**Airspace Assumptions and Air Conformity Applicability Model Data Inputs**

Special Use Airspace	Percent of Total Sorties	No. of Sorties in Airspace <sup>1</sup>	Minimum Mission Altitude	Total Mission Time (minutes) ≤3,000 ft AGL	Power Mode <sup>2</sup>
Tyndall C MOA	2.5	82	300 ft AGL	8.75	Intermediate/ Climb out
Tyndall E MOA	2.5	82	300 ft AGL	8.75	Intermediate/ Climb out
Tyndall B and H MOAs <sup>3</sup>	N/A	N/A	9,000 ft MSL	N/A	N/A
Warning Area W-151	25	820	Surface	8.75	Intermediate/ Climb out
Warning Area W-470	70	2,296	Surface	8.75	Intermediate/ Climb out

Notes:

<sup>1</sup> Based on 3,280 total sorties in special use airspace (Source: CAF ADAIR Calculator - NEPA 6).

<sup>2</sup> ACAM does not have separate inputs for time spent within a MOA. To represent the time spent within a MOA, the expected flight time at or below 3,000 ft (11.9 minutes) was assigned to Climb out/Intermediate power mode within the ACAM LTO input fields. No time was assigned to any other power modes.

<sup>3</sup> Sorties occur above the mixing height. No emissions calculated.

ACAM = Air Conformity Applicability Model; ADAIR = adversary air; AGL = above ground level; CAF = Combat Air Forces; ft = feet; LTO = landing and take-off; N/A = not applicable; MOA = Military Operations Area; NEPA = National Environmental Policy Act

**Table C-6**  
**Times in Mode<sup>1</sup> (minutes) for Aircraft Operations**

Type of Operation	Number of Sorties	Taxi/Idle (out)	Take-off (Military and/or Afterburn	Climb Out	Approach	Taxi/Idle(in)
LTO	3,400	18.5	0.4	0.8	3.5	11.3
TGO <sup>2</sup>	459	-	-	0.8	3.5	-

Notes:

<sup>1</sup> Given time in mode applicable to all emission scenarios (High, Medium, and Low)

<sup>2</sup> 5 percent of on-airfield daytime sorties (3,060) are expected to include multiple patterns for contractor proficiency. Each of those 5 percent sorties is assumed to include three TGO/low approaches.

LTO = landing and take-off; TGO = touch and go

1 C.1.3 Regulatory Comparisons  
2

3 The CAA Section 176(c), General Conformity, requires federal agencies to demonstrate that their proposed  
4 activities would conform to the applicable SIP for attainment of the NAAQS. General conformity applies  
5 only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a  
6 nonattainment area exceed annual *de minimis* thresholds identified in the rule, a formal conformity  
7 determination is required of that action. The thresholds are more restrictive as the severity of the  
8 nonattainment status of the region increases. The Council on Environmental Quality (CEQ) defines  
9 significance in terms of context and intensity in 40 CFR § 1508.27. This requires that the significance of the  
10 action be analyzed with respect to the setting of the proposed action and based relative to the severity of  
11 the impact. The CEQ NEPA regulations (40 CFR § 1508.27[b]) provide 10 key factors to consider in  
12 determining an impact's intensity.  
13

14 Emissions from the proposed action were compared against standard *de minimis* thresholds of 100 tons  
15 per year for Criteria Pollutant as stipulated by 40 CFR Part 93. Emissions were also compared against  
16 regional emissions, and PSD and Title V thresholds to further evaluate impacts. Estimates of emissions are  
17 summarized in **Chapter 4**. ACAM summary reports for each emission scenario for the Tyndall AFB and  
18 associated airspace are provided as **Appendix C-2** of this Air Quality summary report.  
19

20 C.2 REFERENCES  
21

22 USEPA. 1990. Office of Air Quality Planning and Standards. *Draft New Source Review Workshop Manual:*  
23 *Prevention of Significant Deterioration and Nonattainment Permitting*. October.  
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25 USEPA. 2010. *40 CFR Parts 51 and 93, Revisions to the General Conformity Regulations*. 75 Federal  
26 Register 14283, EPA-HQ-OAR-2006-0669; FRL-9131-7. 24 March.  
27

28 USEPA. 2016. *NAAQS Table*. <<https://www.epa.gov/criteria-air-pollutants/naaqs-table>>. 20 December.  
29

30 USEPA. 2017. *General Conformity: De minimis Tables*. <[https://www.epa.gov/general-conformity/de-](https://www.epa.gov/general-conformity/de-minimis-tables)  
31 [minimis-tables](https://www.epa.gov/general-conformity/de-minimis-tables)>. 04 August.  
32

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**Appendix C-2**

**Detailed Air Conformity Applicability Model Sample Report  
(Airfield – High Emission Scenario)**

1

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## 1. General Information

### - Action Location

**Base:** TYNDALL AFB  
**State:** Florida  
**County(s):** Bay  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**- Action Title:** Temporary Adversary Air (ADAIR) at Tyndall AFB, Florida

**- Project Number/s (if applicable):**

**- Projected Action Start Date:** 9 / 2020

**- Action Purpose and Need:**

### - Action Description:

The Proposed Action would contract for an estimated 12 contractor aircraft to fly an estimated 2,400 annual sorties in support of the 33 FW and other units at Eglin AFB. Tyndall AFB would be staffed by an estimated 78 additional contracted maintenance personnel.

The high emission scenario assumes all 12 contractor aircraft are the F-15 with the F100-PW-100 Engine.

### - Point of Contact

**Name:** Austin Naranjo  
**Title:** Environmental Engineer - Air Quality Specialist  
**Organization:** AFCEC/CZTQ  
**Email:**  
**Phone Number:** (210)749-7000

### - Activity List:

Activity Type		Activity Title
2.	Aircraft	Addition of 12 Aircraft at 2,400 LTOs and 324 TGOs
3.	Personnel	93 Additional Personnel for the ADAIR at Tyndall

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

## 2. Aircraft

### 2.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

### - Activity Location

**County:** Bay  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**- Activity Title:** Addition of 12 Aircraft at 2,400 LTOs and 324 TGOs

**- Activity Description:**

- Activity Start Date

Start Month: 9  
Start Year: 2020

- Activity End Date

Indefinite: No  
End Month: 9  
End Year: 2022

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	21.535330
SO <sub>x</sub>	9.933470
NO <sub>x</sub>	116.762708
CO	181.478981
PM 10	16.753772

Pollutant	Total Emissions (TONs)
PM 2.5	15.262478
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	23342.9

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	12.681827
SO <sub>x</sub>	8.150008
NO <sub>x</sub>	91.286427
CO	165.943886
PM 10	14.127535

Pollutant	Total Emissions (TONs)
PM 2.5	12.714781
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	22001.6

- Activity Emissions [Aerospace Ground Equipment (AGE) part]:

Pollutant	Total Emissions (TONs)
VOC	8.853503
SO <sub>x</sub>	1.783461
NO <sub>x</sub>	25.476281
CO	15.535095
PM 10	2.626237

Pollutant	Total Emissions (TONs)
PM 2.5	2.547697
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	1341.3

## 2.2 Aircraft & Engines

### 2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: F-15A  
Engine Model: F100-PW-100  
Primary Function: Combat  
Aircraft has After burn: Yes  
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? Yes  
Original Aircraft Name: MiG-29 Typhoon  
Original Engine Name: Unknown

### 2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO <sub>x</sub>	NO <sub>x</sub>	CO	PM 10	PM 2.5	CO <sub>2</sub> e
Idle	1127.00	3.79	1.07	4.64	49.58	3.13	2.82	3234

Approach	2765.00	1.06	1.07	12.52	3.99	1.57	1.41	3234
Intermediate	7685.00	0.14	1.07	27.09	0.72	0.72	0.65	3234
Military	10996.00	0.12	1.07	35.01	0.70	1.24	1.12	3234
After Burn	54007.00	0.13	1.07	6.62	9.57	0.87	0.78	3234

## 2.3 Flight Operations

### 2.3.1 Flight Operations Assumptions

#### - Flight Operations

Number of Aircraft:	12
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft:	2400
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft:	324
Number of Annual Trim Test(s) per Aircraft:	12

- Default Settings Used: Yes

#### - Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	18.5 (default)
Takeoff [Military] (mins):	0.2 (default)
Takeoff [After Burn] (mins):	0.2 (default)
Climb Out [Intermediate] (mins):	0.8 (default)
Approach [Approach] (mins):	3.5 (default)
Taxi/Idle In [Idle] (mins):	11.3 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

#### - Trim Test

Idle (mins):	12 (default)
Approach (mins):	27 (default)
Intermediate (mins):	9 (default)
Military (mins):	9 (default)
AfterBurn (mins):	3 (default)

### 2.3.2 Flight Operations Formula(s)

#### - Aircraft Emissions per Mode for LTOs per Year

$$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$$

AEM<sub>POL</sub>: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)

60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines

LTO: Number of Landing and Take-off Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

#### - Aircraft Emissions for LTOs per Year

$$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE<sub>LTO</sub>: Aircraft Emissions (TONs)

AEM<sub>IDLE\_IN</sub>: Aircraft Emissions for Idle-In Mode (TONs)

AEM<sub>IDLE\_OUT</sub>: Aircraft Emissions for Idle-Out Mode (TONs)  
AEM<sub>APPROACH</sub>: Aircraft Emissions for Approach Mode (TONs)  
AEM<sub>CLIMBOUT</sub>: Aircraft Emissions for Climb-Out Mode (TONs)  
AEM<sub>TAKEOFF</sub>: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for TGOs per Year**

$$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$$

AEM<sub>POL</sub>: Aircraft Emissions per Pollutant & Mode (TONs)  
TIM: Time in Mode (min)  
60: Conversion Factor minutes to hours  
FC: Fuel Flow Rate (lb/hr)  
1000: Conversion Factor pounds to 1000pounds  
EF: Emission Factor (lb/1000lb fuel)  
NE: Number of Engines  
TGO: Number of Touch-and-Go Cycles (for all aircraft)  
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for TGOs per Year**

$$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$$

AE<sub>TGO</sub>: Aircraft Emissions (TONs)  
AEM<sub>APPROACH</sub>: Aircraft Emissions for Approach Mode (TONs)  
AEM<sub>CLIMBOUT</sub>: Aircraft Emissions for Climb-Out Mode (TONs)  
AEM<sub>TAKEOFF</sub>: Aircraft Emissions for Take-Off Mode (TONs)

**- Aircraft Emissions per Mode for Trim per Year**

$$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$$

AEPS<sub>POL</sub>: Aircraft Emissions per Pollutant & Power Setting (TONs)  
TD: Test Duration (min)  
60: Conversion Factor minutes to hours  
FC: Fuel Flow Rate (lb/hr)  
1000: Conversion Factor pounds to 1000pounds  
EF: Emission Factor (lb/1000lb fuel)  
NE: Number of Engines  
NA: Number of Aircraft  
NTT: Number of Trim Test  
2000: Conversion Factor pounds to TONs

**- Aircraft Emissions for Trim per Year**

$$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$$

AE<sub>TRIM</sub>: Aircraft Emissions (TONs)  
AEPS<sub>IDLE</sub>: Aircraft Emissions for Idle Power Setting (TONs)  
AEPS<sub>APPROACH</sub>: Aircraft Emissions for Approach Power Setting (TONs)  
AEPS<sub>INTERMEDIATE</sub>: Aircraft Emissions for Intermediate Power Setting (TONs)  
AEPS<sub>MILITARY</sub>: Aircraft Emissions for Military Power Setting (TONs)  
AEPS<sub>AFTERBURN</sub>: Aircraft Emissions for After Burner Power Setting (TONs)

## 2.4 Auxiliary Power Unit (APU)

### 2.4.1 Auxiliary Power Unit (APU) Assumptions

**- Default Settings Used:** Yes

**- Auxiliary Power Unit (APU) (default)**

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer
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**2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)**

**- Auxiliary Power Unit (APU) Emission Factor (lb/hr)**

Designation	Fuel Flow	VOC	SO <sub>x</sub>	NO <sub>x</sub>	CO	PM 10	PM 2.5	CO <sub>2e</sub>
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**2.4.3 Auxiliary Power Unit (APU) Formula(s)**

**- Auxiliary Power Unit (APU) Emissions per Year**

$$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$$

APU<sub>POL</sub>: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)

APU: Number of Auxiliary Power Units

OH: Operation Hours for Each LTO (hour)

LTO: Number of LTOs

EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hr)

2000: Conversion Factor pounds to tons

**2.5 Aerospace Ground Equipment (AGE)**

**2.5.1 Aerospace Ground Equipment (AGE) Assumptions**

**- Default Settings Used:** Yes

**- AGE Usage**

Number of Annual LTO (Landing and Take-off) cycles for AGE: 2400

**- Aerospace Ground Equipment (AGE) (default)**

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	0.33	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Bomb Lift	MJ-1B
1	0.33	No	Generator Set	A/M32A-86D
1	0.5	No	Heater	H1
1	0.5	No	Hydraulic Test Stand	MJ-2/TTU-228 - 130hp
1	8	No	Light Cart	NF-2
1	0.33	No	Start Cart	A/M32A-60A

**2.5.2 Aerospace Ground Equipment (AGE) Emission Factor(s)**

**- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)**

Designation	Fuel Flow	VOC	SO <sub>x</sub>	NO <sub>x</sub>	CO	PM 10	PM 2.5	CO <sub>2e</sub>
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
MJ-1B	0.0	3.040	0.219	4.780	3.040	0.800	0.776	141.2
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2/TTU-228 - 130hp	7.4	0.195	0.053	3.396	0.794	0.089	0.086	168.8
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

### 2.5.3 Aerospace Ground Equipment (AGE) Formula(s)

#### - Aerospace Ground Equipment (AGE) Emissions per Year

$$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$$

AGE<sub>POL</sub>: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)

AGE: Total Number of Aerospace Ground Equipment

OH: Operation Hours for Each LTO (hour)

LTO: Number of LTOs

EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hr)

2000: Conversion Factor pounds to tons

## 3. Personnel

### 3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

#### - Activity Location

County: Bay

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: 93 Additional Personnel for the ADAIR at Tyndall

#### - Activity Description:

#### - Activity Start Date

Start Month: 9

Start Year: 2020

#### - Activity End Date

Indefinite: No

End Month: 9

End Year: 2022

#### - Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.434237
SO <sub>x</sub>	0.002917
NO <sub>x</sub>	0.350319
CO	4.976922
PM 10	0.007758

Pollutant	Total Emissions (TONs)
PM 2.5	0.006606
Pb	0.000000
NH <sub>3</sub>	0.026791
CO <sub>2</sub> e	446.6

### 3.2 Personnel Assumptions

#### - Number of Personnel

Active Duty Personnel: 93

Civilian Personnel: 0

Support Contractor Personnel: 0

Air National Guard (ANG) Personnel: 0

Reserve Personnel: 0

**- Default Settings Used:** Yes

**- Average Personnel Round Trip Commute (mile):** 20 (default)

**- Personnel Work Schedule**

**Active Duty Personnel:** 5 Days Per Week (default)

**Civilian Personnel:** 5 Days Per Week (default)

**Support Contractor Personnel:** 5 Days Per Week (default)

**Air National Guard (ANG) Personnel:** 4 Days Per Week (default)

**Reserve Personnel:** 4 Days Per Month (default)

**3.3 Personnel On Road Vehicle Mixture**

**- On Road Vehicle Mixture (%)**

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

**3.4 Personnel Emission Factor(s)**

**- On Road Vehicle Emission Factors (grams/mile)**

	VOC	SO <sub>x</sub>	NO <sub>x</sub>	CO	PM 10	PM 2.5	Pb	NH <sub>3</sub>	CO <sub>2e</sub>
LDGV	000.282	000.002	000.207	003.392	000.006	000.005		000.023	00341.791
LDGT	000.376	000.003	000.373	004.889	000.007	000.006		000.024	00439.705
HDGV	000.832	000.005	000.964	016.217	000.016	000.014		000.046	00814.851
LDDV	000.084	000.003	000.127	002.822	000.004	000.004		000.008	00334.379
LDDT	000.227	000.004	000.365	004.850	000.007	000.006		000.008	00473.628
HDDV	000.423	000.014	004.175	001.653	000.176	000.162		000.028	01559.331
MC	003.040	000.003	000.626	013.017	000.026	000.023		000.052	00392.775

**3.5 Personnel Formula(s)**

**- Personnel Vehicle Miles Travel for Work Days per Year**

$$VMT_P = NP * WD * AC$$

VMT<sub>P</sub>: Personnel Vehicle Miles Travel (miles/year)

NP: Number of Personnel

WD: Work Days per Year

AC: Average Commute (miles)

**- Total Vehicle Miles Travel per Year**

$$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$$

VMT<sub>Total</sub>: Total Vehicle Miles Travel (miles)

VMT<sub>AD</sub>: Active Duty Personnel Vehicle Miles Travel (miles)

VMT<sub>C</sub>: Civilian Personnel Vehicle Miles Travel (miles)

VMT<sub>SC</sub>: Support Contractor Personnel Vehicle Miles Travel (miles)

VMT<sub>ANG</sub>: Air National Guard Personnel Vehicle Miles Travel (miles)

VMT<sub>AFRC</sub>: Reserve Personnel Vehicle Miles Travel (miles)

**- Vehicle Emissions per Year**

$$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$$

V<sub>POL</sub>: Vehicle Emissions (TONs)

VMT<sub>Total</sub>: Total Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

- 1 EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
- 2 VM: Personnel On Road Vehicle Mixture (%)
- 3 2000: Conversion Factor pounds to tons
- 4
- 5

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**Appendix C-3**

**Summary Air Conformity Applicability Model Reports  
Record of Air Analysis (ROAA)**

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## TYNDALL AIR FORCE BASE HIGH SCENARIO SUMMARY

**1. General Information:** The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** TYNDALL AFB  
**State:** Florida  
**County(s):** Bay  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Temporary Adversary Air (ADAIR) at Tyndall AFB, Florida

**c. Project Number/s (if applicable):**

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

The Proposed Action would contract for an estimated 12 contractor aircraft to fly an estimated 2,400 annual sorties in support of the 33 FW and other units at Eglin AFB. Tyndall AFB would be staffed by an estimated 78 additional contracted maintenance personnel.

The high emission scenario assumes all 12 contractor aircraft are the F-15 with the F100-PW-100 Engine.

**f. Point of Contact:**

**Name:** Austin Naranjo  
**Title:** Environmental Engineer - Air Quality Specialist  
**Organization:** AFCEC/CZTQ  
**Email:**  
**Phone Number:** (210)749-7000

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emissions within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR

de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

**Analysis Summary:**

**2020**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.515	100	No
NOx	18.738	100	No
CO	29.833	100	No
SOx	1.590	100	No
PM 10	2.682	100	No
PM 2.5	2.443	100	No
Pb	0.000	25	No
NH3	0.004	100	No
CO2e	3806.3		

**2021**

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	56.214	100	No
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		

**2022**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.909	100	No
NOx	42.161	100	No
CO	67.124	100	No
SOx	3.577	100	No
PM 10	6.034	100	No
PM 2.5	5.497	100	No
Pb	0.000	25	No
NH3	0.010	100	No
CO2e	8564.2		

**2023 - (Steady State)**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No

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**Draft**

<b>SO<sub>x</sub></b>	0.000	100	No
<b>PM 10</b>	0.000	100	No
<b>PM 2.5</b>	0.000	100	No
<b>Pb</b>	0.000	25	No
<b>NH<sub>3</sub></b>	0.000	100	No
<b>CO<sub>2e</sub></b>	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

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Austin Naranjo, Environmental Engineer - Air Quality Specialist

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DATE

## TYNDALL AIR FORCE BASE MEDIUM SCENARIO SUMMARY

**1. General Information:** The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** TYNDALL AFB  
**State:** Florida  
**County(s):** Bay  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Temporary Adversary Air (ADAIR) at Tyndall AFB, Florida

**c. Project Number/s (if applicable):**

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

The Proposed Action would contract for an estimated 12 contractor aircraft to fly an estimated 2,400 annual sorties in support of the 33 FW and other units at Eglin AFB. Tyndall AFB would be staffed by an estimated 78 additional contracted maintenance personnel.

The medium emission scenario assumes all 12 contractor aircraft are the F-16 with the F110-GE-100 Engine.

**f. Point of Contact:**

**Name:** Austin Naranjo  
**Title:** Environmental Engineer - Air Quality Specialist  
**Organization:** AFCEC/CZTQ  
**Email:**  
**Phone Number:** (210)749-7000

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emissions within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR

de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

**Analysis Summary:**

**2020**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.804	100	No
NOx	10.905	100	No
CO	15.079	100	No
SOx	1.036	100	No
PM 10	1.534	100	No
PM 2.5	1.023	100	No
Pb	0.000	25	No
NH3	0.004	100	No
CO2e	2536.5		

**2021**

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	32.714	100	No
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		

**2022**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.058	100	No
NOx	24.536	100	No
CO	33.927	100	No
SOx	2.332	100	No
PM 10	3.451	100	No
PM 2.5	2.301	100	No
Pb	0.000	25	No
NH3	0.010	100	No
CO2e	5707.0		

**2023 - (Steady State)**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No

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<b>SOx</b>	0.000	100	No
<b>PM 10</b>	0.000	100	No
<b>PM 2.5</b>	0.000	100	No
<b>Pb</b>	0.000	25	No
<b>NH3</b>	0.000	100	No
<b>CO2e</b>	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Austin Naranjo, Environmental Engineer - Air Quality Specialist

DATE

## TYNDALL AIR FORCE BASE LOW SCENARIO SUMMARY

**1. General Information:** The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Instruction 32-7040, Air Quality Compliance And Resource Management; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** TYNDALL AFB

**State:** Florida

**County(s):** Bay

**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Temporary Adversary Air (ADAIR) at Tyndall AFB, Florida

**c. Project Number/s (if applicable):**

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

The Proposed Action would contract for an estimated 12 contractor aircraft to fly an estimated 2,400 annual sorties in support of the 33 FW and other units at Eglin AFB. Tyndall AFB would be staffed by an estimated 78 additional contracted maintenance personnel.

The low emission scenario assumes all 12 contractor aircraft are the F-5.

**f. Point of Contact:**

**Name:** Austin Naranjo

**Title:** Environmental Engineer - Air Quality Specialist

**Organization:** AFCEC/CZTQ

**Email:**

**Phone Number:** (210)749-7000

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emissions within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR

de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

**Analysis Summary:**

**2020**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	10.017	100	No
NOx	4.884	100	No
CO	52.836	100	No
SOx	0.754	100	No
PM 10	0.424	100	No
PM 2.5	0.411	100	No
Pb	0.000	25	No
NH3	0.004	100	No
CO2e	1641.8		

**2021**

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	14.653	100	No
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		

**2022**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	22.538	100	No
NOx	10.990	100	No
CO	118.882	100	Yes
SOx	1.697	100	No
PM 10	0.955	100	No
PM 2.5	0.925	100	No
Pb	0.000	25	No
NH3	0.010	100	No
CO2e	3694.1		

**2023 - (Steady State)**

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No

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**Draft**

<b>SOx</b>	0.000	100	No
<b>PM 10</b>	0.000	100	No
<b>PM 2.5</b>	0.000	100	No
<b>Pb</b>	0.000	25	No
<b>NH3</b>	0.000	100	No
<b>CO2e</b>	0.0		

Some estimated emissions associated with this action are above the GCR indicators, indicating a significant impact to air quality; therefore, further air assessment is needed.

\_\_\_\_\_  
Austin Naranjo, Environmental Engineer - Air Quality Specialist

\_\_\_\_\_  
DATE

EGLIN E MILITARY OPERATIONS AREA HIGH EMISSION SCENARIO

**1. General Information:** The Air Force's ACAM was used to perform an analysis to assess the potential air quality impact(s) associated with the action in accordance with AFI 32-7040; the EIAP (32 CFR Part 989); and the GCR (40 CFR Part 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** EGLIN AFB  
**State:** Florida  
**County(s):** Okaloosa; Santa Rosa; Walton  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Eglin MOA E Emissions

**c. Project Number/s (if applicable):** Eglin MOA E Emissions

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

Eglin MOA E Emissions

**f. Point of Contact:**

**Name:** Isaac Jimenez  
**Title:** Contractor  
**Organization:** Versar  
**Email:** ijimenez@versar.com  
**Phone Number:** 830-776-2315

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are USEPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/year is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR § 93.153); therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.086	100	No
NOx	16.420	100	No
CO	0.436	100	No
SOx	0.643	100	No
PM 10	0.436	100	No
PM 2.5	0.393	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1960.2		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

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2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.086	100	No
NOx	16.420	100	No
CO	0.436	100	No
SOx	0.643	100	No
PM 10	0.436	100	No
PM 2.5	0.393	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1960.2		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Isaac Jimenez, Contractor

DATE

EGLIN E MILITARY OPERATIONS AREA MEDIUM EMISSION SCENARIO

**1. General Information:** The Air Force's ACAM was used to perform an analysis to assess the potential air quality impact(s) associated with the action in accordance with AFI 32-7040; the EIAP (32 CFR Part 989); and the GCR (40 CFR Part 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** EGLIN AFB  
**State:** Florida  
**County(s):** Okaloosa; Santa Rosa; Walton  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Eglin MOA E Emissions

**c. Project Number/s (if applicable):** Eglin MOA E Emissions

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

Eglin MOA E Emissions

**f. Point of Contact:**

**Name:** Isaac Jimenez  
**Title:** Contractor  
**Organization:** Versar  
**Email:** ijimenez@versar.com  
**Phone Number:** 830-776-2315

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are USEPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/year is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR § 93.153); therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.147	100	No
NOx	5.221	100	No
CO	2.018	100	No
SOx	0.385	100	No
PM 10	0.202	100	No
PM 2.5	0.129	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1181.0		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.147	100	No
NOx	5.221	100	No
CO	2.018	100	No
SOx	0.385	100	No
PM 10	0.202	100	No
PM 2.5	0.129	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1181.0		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Isaac Jimenez, Contractor

DATE

EGLIN E MILITARY OPERATIONS AREA LOW EMISSION SCENARIO

**1. General Information:** The Air Force's ACAM was used to perform an analysis to assess the potential air quality impact(s) associated with the action in accordance with AFI 32-7040; the EIAP (32 CFR Part 989); and the GCR (40 CFR Part 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** EGLIN AFB  
**State:** Florida  
**County(s):** Okaloosa; Santa Rosa; Walton  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Eglin MOA E Emissions

**c. Project Number/s (if applicable):** Eglin MOA E Emissions

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

Eglin MOA E Emissions

**f. Point of Contact:**

**Name:** Isaac Jimenez  
**Title:** Contractor  
**Organization:** Versar  
**Email:** ijimenez@versar.com  
**Phone Number:** 830-776-2315

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are USEPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/year is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR § 93.153); therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.705	100	No
NOx	0.403	100	No
CO	7.536	100	No
SOx	0.186	100	No
PM 10	0.002	100	No
PM 2.5	0.002	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	566.8		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

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2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

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2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.705	100	No
NOx	0.403	100	No
CO	7.536	100	No
SOx	0.186	100	No
PM 10	0.002	100	No
PM 2.5	0.002	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	566.8		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Isaac Jimenez, Contractor

DATE

**WARNING AREA W-151 HIGH EMISSION SCENARIO**

**1. General Information:** The Air Force's ACAM was used to perform an analysis to assess the potential air quality impact(s) associated with the action in accordance with AFI 32-7040; the EIAP (32 CFR Part 989); and the GCR (40 CFR Part 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** EGLIN AFB  
**State:** Florida  
**County(s):** Okaloosa; Santa Rosa; Walton  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Eglin W-151

**c. Project Number/s (if applicable):** Eglin W-151

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

Eglin W-151

**f. Point of Contact:**

**Name:** Isaac Jimenez  
**Title:** Contractor  
**Organization:** Versar  
**Email:** ijimenez@versar.com  
**Phone Number:** 830-776-2315

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are USEPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/year is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR § 93.153); therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.086	100	No
NOx	16.420	100	No
CO	0.436	100	No
SOx	0.643	100	No
PM 10	0.436	100	No
PM 2.5	0.393	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1960.2		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

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2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

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2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.172	100	No
NOx	32.840	100	No
CO	0.873	100	No
SOx	1.285	100	No
PM 10	0.873	100	No
PM 2.5	0.786	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	3920.5		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.086	100	No
NOx	16.420	100	No
CO	0.436	100	No
SOx	0.643	100	No
PM 10	0.436	100	No
PM 2.5	0.393	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1960.2		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Isaac Jimenez, Contractor

DATE

**WARNING AREA W-151 MEDIUM EMISSION SCENARIO**

**1. General Information:** The Air Force's ACAM was used to perform an analysis to assess the potential air quality impact(s) associated with the action in accordance with AFI 32-7040; the EIAP (32 CFR Part 989); and the GCR (40 CFR Part 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** EGLIN AFB  
**State:** Florida  
**County(s):** Okaloosa; Santa Rosa; Walton  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Eglin W-151

**c. Project Number/s (if applicable):** Eglin W-151

**d. Projected Action Start Date:** 9/ 2020

**e. Action Description:**

Eglin W-151

**f. Point of Contact:**

**Name:** Isaac Jimenez  
**Title:** Contractor  
**Organization:** Versar  
**Email:** ijimenez@versar.com  
**Phone Number:** 830-776-2315

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are USEPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/year is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR § 93.153); therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.147	100	No
NOx	5.221	100	No
CO	2.018	100	No
SOx	0.385	100	No
PM 10	0.202	100	No
PM 2.5	0.129	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1181.0		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

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2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

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2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

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2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

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2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

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2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.293	100	No
NOx	10.441	100	No
CO	4.037	100	No
SOx	0.769	100	No
PM 10	0.404	100	No
PM 2.5	0.257	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	2362.0		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.147	100	No
NOx	5.221	100	No
CO	2.018	100	No
SOx	0.385	100	No
PM 10	0.202	100	No
PM 2.5	0.129	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1181.0		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Isaac Jimenez, Contractor

DATE

**WARNING AREA W-151 LOW EMISSION SCENARIO**

**1. General Information:** The Air Force's ACAM was used to perform an analysis to assess the potential air quality impact(s) associated with the action in accordance with AFI 32-7040; the EIAP (32 CFR Part 989); and the GCR (40 CFR Part 93 Subpart B). This report provides a summary of the ACAM analysis.

**a. Action Location:**

**Base:** EGLIN AFB  
**State:** Florida  
**County(s):** Walton; Santa Rosa; Okaloosa  
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**b. Action Title:** Eglin W-151

**c. Project Number/s (if applicable):** Eglin W-151

**d. Projected Action Start Date:** 9 / 2020

**e. Action Description:**

Eglin W-151

**f. Point of Contact:**

**Name:** Isaac Jimenez  
**Title:** Contractor  
**Organization:** Versar  
**Email:** ijimenez@versar.com  
**Phone Number:** 830-776-2315

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

\_\_\_\_\_ applicable  
\_\_X\_\_ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are USEPA GCR thresholds (*de minimis* levels) that are applied out of context to their intended use; therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR *de minimis* threshold values are the maximum net change an action can acceptably emit in nonattainment and maintenance areas, these threshold values would also conservatively indicate an actions emission within an attainment would also be acceptable. An air quality indicator value of 100 tons/year is used based on the GCR *de minimis* threshold for the least severe nonattainment classification for all criteria pollutants (see 40 CFR § 93.153); therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.705	100	No
NOx	0.403	100	No
CO	7.536	100	No
SOx	0.186	100	No
PM 10	0.002	100	No
PM 2.5	0.002	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	566.8		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

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2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

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2025

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2026

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2027

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2028

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.411	100	No
NOx	0.806	100	No
CO	15.072	100	No
SOx	0.372	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	1133.5		

2029

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.705	100	No
NOx	0.403	100	No
CO	7.536	100	No
SOx	0.186	100	No
PM 10	0.002	100	No
PM 2.5	0.002	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	566.8		

2030 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	100	No
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000	25	No
NH3	0.000	100	No
CO2e	0.0		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

Isaac Jimenez, Contractor

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## **APPENDIX D**

### **LISTED SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA**

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1 **THREATENED AND ENDANGERED SPECIES/CRITICAL HABITAT**

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3 A list of species that could potentially occur at Tyndall Air Force Base (AFB), in areas within the noise  
4 contours and safety zones, and within the Tyndall Military Operations Areas, Air Traffic Control Assigned  
5 Airspaces, and Warning Areas was obtained from the United States Fish and Wildlife Service (USFWS)  
6 Environmental Conservation Online System website, National Marine Fisheries Service (NMFS) Listed  
7 Species lists, Florida Fish and Wildlife Conservation Commission (FWC), Florida Natural Areas Inventory  
8 (FNAI), and the Tyndall AFB Integrated Natural Resources Management Plan. The complete list of all  
9 federal and state listed species with the potential to occur in or near Tyndall AFB and the special use  
10 airspace is provided in **Table D-1**.

11  
12 **References**

13 FNAI. 2019. *Searchable Tracking List*. <<https://www.fnai.org/trackinglist.cfm>>. Accessed May 2019.

14 FWC. 2019. *Species Profiles*. <<https://myfwc.com/wildlifehabitats/profiles>>. Accessed May 2019.

15 Tyndall AFB. 2015. *Tyndall Air Force Base Integrated Natural Resources Management Plan*.

16 USFWS. 2019. *Environmental Conservation Online System*. <<https://ecos.fws.gov/ecp/>>. Accessed April  
17 2019.

**Table D-1**  
**Federally and State Listed Species with the Potential to Occur at Tyndall Air Force Base and the**  
**Special Use Airspace**

Species	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Tyndall AFB	Special Use Airspace					
				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Birds									
American oystercatcher ( <i>Haematopus palliatus</i> )	-	T		X					
Black skimmer ( <i>Rynchops niger</i> )	-	T		X					
Eastern black rail ( <i>Laterallus jamaicensis</i> ssp. <i>jamaicensis</i> )	PT	-					X		
Florida burrowing owl ( <i>Athene cunicularia floridana</i> )	-	T		X					
Florida sandhill crane ( <i>Antigone canadensis pratensis</i> )	-	T		X					
Least tern ( <i>Sterna antillarum</i> )	-	T	X	X		X	X		
Little blue heron ( <i>Egretta caerulea</i> )	-	T		X	X				
Marian's marsh wren ( <i>Cistothorus palustris marianae</i> )	-	T		X					
Piping plover ( <i>Charadrius melodus</i> )	T	T		X		X	X		
Reddish egret ( <i>Egretta rufescens</i> )	-	T		X					
Red-cockaded woodpecker ( <i>Picoides borealis</i> )	E	E	X	X	X	X	X		
Red knot ( <i>Calidris canutus rufa</i> )	T	T	X	X		X	X		
Snowy plover ( <i>Charadrius alexandrinus tenuirostris</i> )	-	T	X	X		X	X		
Southeastern American kestrel ( <i>Falco sparverius paulus</i> )	-	T	X	X	X	X	X		
Tricolored heron ( <i>Egretta tricolor</i> )	-	T		X	X				

**Table D-1**  
**Federally and State Listed Species with the Potential to Occur at Tyndall Air Force Base and the**  
**Special Use Airspace**

Species	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Tyndall AFB	Special Use Airspace					
				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Wood stork ( <i>Mycteria americana</i> )	T	T	X	X	X	X	X		
<b>Mammals</b>									
Choctawhatchee beach mouse ( <i>Peromyscus polionotus allophtys</i> )	E	E	X	X		X			
Fin whale ( <i>Balaenoptera physalus</i> )	E	-						X	X
Bryde's whale – Gulf of Mexico DPS ( <i>Balaenoptera edeni</i> )	E	-						X	X
Gray bat ( <i>Myotis grisescens</i> )	E	E			X	X			
Red wolf ( <i>Canis rufus</i> )	E	E					X		
Sperm whale ( <i>Physeter macrocephalus</i> )	E	-						X	X
Sei whale ( <i>Balaenoptera borealis</i> )	E	-						X	X
St. Andrew beach mouse ( <i>Peromyscus polionotus peninsularis</i> )	E	E	X		X	X			
West Indian manatee ( <i>Trichechus manatus</i> )	T	-	X	X	X	X			
<b>Reptiles</b>									
Eastern indigo snake ( <i>Drymarchon corais couperi</i> )	T	T	X			X	X		
Florida pine snake ( <i>Pituophis melanoleucus mugitus</i> )	-	T							
Gopher tortoise ( <i>Gopherus polyphemus</i> )	C	T	X			X	X		
American alligator ( <i>Alligator mississippiensis</i> )	T (S/A)	-	X	X	X	X	X		
Green turtle (North Atlantic DPS) ( <i>Chelonia mydas</i> )	T	-	X	X		X	X	X	X

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Species	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Tyndall AFB	Special Use Airspace					
				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Hawksbill turtle ( <i>Eretmochelys imbricata</i> )	E	-	X	X		X	X	X	X
Kemp's ridley sea turtle ( <i>Lepidochelys kempii</i> )	E	-	X	X		X	X	X	X
Leatherback turtle ( <i>Dermochelys coriacea</i> )	E	-	X	X		X	X	X	X
Loggerhead turtle (Northwest Atlantic DPS) ( <i>Caretta caretta</i> )	T	-	X	X		X	X	X	X
<b>Amphibians</b>									
Florida bog frog ( <i>Lithobates okaloosae</i> )	-	T		X					
Red Hills salamander ( <i>Phaeognathus hubrichti</i> )	T	-			X				
Reticulated flatwoods salamander ( <i>Ambystoma bishopi</i> )	T	T	X			X	X		
<b>Fish</b>									
Atlantic sturgeon (Gulf subspecies) ( <i>Acipenser oxyrinchus</i> [=oxyrhynchus] <i>desotoi</i> )	T	T	X			X	X		
Blackmouth shiner ( <i>Notropis melanostamus</i> )	-	T		X					
Giant manta ray ( <i>Manta birostris</i> )	T	T						X	X
Gulf sturgeon ( <i>Acipenser oxyrinchus desotoi</i> )	T	T		X	X			X	X
Nassau grouper ( <i>Epinephelus striatus</i> )	T	T						X	X
Oceanic whitetip shark ( <i>Carcharhinus longimanus</i> )	T	-						X	X
Okaloosa darter ( <i>Etheostoma okaloosae</i> )	T			X					
Smalltooth sawfish ( <i>Pristis pectinata</i> )	E	E						X	X

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Mollusks									
Alabama pearlshell ( <i>Margaritifera marrianae</i> )	E	E			X				
Chipola slabshell ( <i>Elliptio chipolaensis</i> )	T	T	X			X	X		
Choctaw bean ( <i>Villosa choctawensis</i> )	E	E	X	X		X			
Fat threeridge (mussel) ( <i>Amblema neislerii</i> )	E	E	X			X	X		
Fuzzy pigtoe ( <i>Pleurobema strodeanum</i> )	T	T	X	X		X			
Gulf moccasinshell ( <i>Medionidus penicillatus</i> )	E	E	X			X			
Narrow pigtoe ( <i>Fusconaia escambia</i> )	T			X					
Ochlockonee moccasinshell ( <i>Medionidus simpsonianus</i> )	E	E				X	X		
Oval pigtoe ( <i>Pleurobema pyriforme</i> )	E	E	X			X			
Purple bankclimber (mussel) ( <i>Elliptoideus sloatianus</i> )	T	T	X			X	X		
Round ebonyshell ( <i>Fusconaia rotulata</i> )	E	E			X				
Shinyrayed pocketbook ( <i>Lampsilis subangulata</i> )	E	E	X			X			
Southern kidneyshell ( <i>Ptychobranthus jonesi</i> )	E	E	X	X		X			
Southern sandshell ( <i>Hamiota australis</i> )	T	T	X	X					
Tapered pigtoe ( <i>Fusconaia burkei</i> )	T	T	X	X		X			
Crustaceans									

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Panama City crayfish ( <i>Procambarus econfinae</i> )	PT	SSC	X	X		X			
<b>Plants</b>									
Alabama spiney pod ( <i>Matela alabamensis</i> )	-	E		X	X				
Apalachicola dragonhead ( <i>Physotegia godfreyi</i> )	-	T	X			X	X		
Apalachicola rosemary ( <i>Conradina glabra</i> )	E	-				X	X		
Arkansas oak ( <i>Quercus arkansana</i> )	-	T		X	X				
Ashe's magnolia ( <i>Magnolia ashei</i> )	-	E		X	X				
Batzel's sedge ( <i>Carex baltzelli</i> )	-	T		X					
Beacked spikerush ( <i>Eleocharis rostellata</i> )	-	E		X					
Bogbuttons ( <i>Lachnocaulon digynum</i> )	-	T		X					
Bog spice bush ( <i>Lindera subcoriacea</i> )	-	E		X	X				
Carolina lily ( <i>Lilium michauxii</i> )	-	E		X	X				
Chaffseed ( <i>Schwalbea americana</i> )	-	E		X					
Chapman's butterwort ( <i>Pinguicula planifolia</i> )	-	T	X			X	X		
Chapman's crownbeard ( <i>Verbesina chapmanii</i> )	-	T	X			X	X		
Chapman rhododendron ( <i>Rhododendron chapmanii</i> )	E	-				X	X		

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Cooley's meadowrue ( <i>Thalictrum cooley</i> )	E	-		X		X	X		
Coville's rush ( <i>Juncus gymnocarpus</i> )	-	E		X					
Cruise's golden aster ( <i>Chrysopsis gossypina</i> ssp. <i>cruiseana</i> )	-	E		X					
Curtiss' sandgrass ( <i>Calamovilfa curtissii</i> )	-	T		X					
Dew thread sundew ( <i>Drosera filiformis</i> )	-	E	X			X	X		
Dwarf witch-alder ( <i>Fothergilla gardenia</i> )	-	E		X					
Eared coneflower ( <i>Rudbeckia auriculata</i> )	-	E		X	X				
Florida skullcap ( <i>Scutellaria floridana</i> )	T	-	X	X	X	X	X		
Florida torreyia ( <i>Torreya taxifolia</i> )	E	-				X	X		
Fringed campion ( <i>Silene polypetala</i> )	E	-				X			
Gentian pinkroot ( <i>Spigelia gentianoides</i> )	E	-		X		X			
Giant water dropwort ( <i>Oxypolis greenmanii</i> )	-	E	X			X	X		
Godfrey's butterwort ( <i>Pinguicula ionantha</i> )	T	E	X	X	X	X	X		
Godfrey's golden aster ( <i>Chrysopsis godfreyi</i> )	-	E	X	X		X	X		
Green adder's mouth ( <i>Malaxis unifolia</i> )	-	E		X					
Gulf coast lupine ( <i>Lupinus westianus</i> )	-	T	X	X	X	X	X		

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Harper's beauty ( <i>Harperocalis flava</i> )	E	-	X	X	X	X	X		
Harper's yellow-eyed grass ( <i>Xyris scabrifolia</i> )	-	T	X	X	X	X	X		
Harry peduncled beakrush ( <i>Rhynchospora crinipes</i> )	-	E		X					
Heartfelt ( <i>Hexastylis arifolia</i> )	-	T		X					
Henry's spider lily ( <i>Hymenocallis henryae</i> )	-	E	X	X	X	X	X		
Hummingbird flower ( <i>Macranthera flammea</i> )	-	E		X					
Indian cucumber-root ( <i>Medeola virginiana</i> )	-	E		X					
Karst pond yellow-eyed grass ( <i>Xyris longisepala</i> )	-	E	X	X	X	X	X		
Large-leaved jointweed ( <i>Polygonella macrophylla</i> )	-	T	X	X	X	X	X		
Little club-spur orchid ( <i>Platanthera clavellata</i> )	-	E		X					
Many-flowered grass-pink ( <i>Calopogon multiflorus</i> )	-	E		X					
Mountain laurel ( <i>Kalmia latifolia</i> )	-	T		X					
Naked-stemmed panic grass ( <i>Panicum nudicaule</i> )	-	T		X	X				
Orange azalea ( <i>Rhododendron austrinum</i> )	-	E		X	X				
Panhandle lily ( <i>Lilium iridollae</i> )	-	E		X					
Panhandle meadowbeauty ( <i>Rhexia salicifolia</i> )	-	T		X					

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Papery whitlow-wort ( <i>Paronychia chartacea</i> )	T	-	X	X		X			
Parrot pitcher plant ( <i>Sarracenia psittacina</i> )	-	T	X			X	X		
Piedmont jointgrass ( <i>Coelorachis tuberculosa</i> )	-	T		X					
Pine barren false-foxglove ( <i>Agalinis georgiana</i> )	-	E		X					
Pineland hoary pea ( <i>Tephrosia mohrii</i> )	-	T		X	X				
Pine sap ( <i>Monotropa hypopithys</i> )	-	E		X	X				
Pine woods bluestem ( <i>Andropogon arctatus</i> )	-	E		X					
Pineland wild indigo ( <i>Baptisia calycosa</i> var <i>villosa</i> )	-	T		X					
Pondberry ( <i>Lindera melissifolia</i> )	E	-			X				
Pondspice ( <i>Litsea aestivalis</i> )	-	E		X					
Primrose-flowered butterwort ( <i>Pinguicula primuliflora</i> )	-	E		X					
Purple pitcher plant ( <i>Sarracenia rosea</i> )	-	T	X			X	X		
Pyramid magnolia ( <i>Magnolia pyramidata</i> )	-	E		X	X				
Quillwort yellow-eyed grass ( <i>Xyris isoetifolia</i> )	-	E	X			X	X		
Serviceberry holly ( <i>Ilex amelanchier</i> )	-	T		X					
Silky camellia ( <i>Stewartia malacodendron</i> )	-	E		X					

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
Small-flowered meadow beauty ( <i>Rhexia parviflora</i> )	-	E		X					
Small spreading pogonia ( <i>Pogonia bifaria</i> )	-	E	X			X	X		
Snakemouth orchid ( <i>Pogonia ophioglossoides</i> )	-	T	X			X	X		
Southern milkweed ( <i>Asclepias viridula</i> )	-	T	X	X	X	X	X		
Southern red lily ( <i>Lilium catesbaei</i> )	-	T	X			X	X		
Spoon-leafed sundew ( <i>Drosera intermedia</i> )	-	T	X			X	X		
Southern yellow fringeless orchid ( <i>Platanthera integra</i> )	-	E		X	X				
Sweet pitcherplant ( <i>Sarracenia rubra</i> )	-	T		X	X				
Sweet shrub ( <i>Calycanthus floridus</i> var. <i>floridus</i> )	-	E		X					
Telephus spurge ( <i>Euphorbia telephoides</i> )	T	-	X	X	X	X	X		
Thick-leaved water willow ( <i>Justicia crassifolia</i> )	-	E	X			X	X		
Thorne's buckthorn ( <i>Sideroxylon thornei</i> )	-	E		X					
Toothed savory ( <i>Calamintha dentata</i> )	-	T		X					
Trailing arbutus ( <i>Epigaea repens</i> )	-	E		X					
Umbrella magnolia ( <i>Magnolia tripetala</i> )	-	E		X					
West's flax ( <i>Linum westii</i> )	-	E		X					

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				Eglin E MOA	Rose Hill MOA	Tyndall B and C/H MOAs	Tyndall E MOA	Warning Area W-151	Warning Area W-470
White birds-in-a-nest ( <i>Macbridea alba</i> )	T	-	X	X	X	X	X		
White-flowered wild petunia ( <i>Ruellia noctiflora</i> )	-	E	X			X	X		
Wild pink ( <i>Silene caroliniana</i> )	-	E		X	X				
Wiregrass gentian ( <i>Gentiana pennelliana</i> )	-	E	X			X	X		
Yellow-flowered butterwort ( <i>Pinguicula lutea</i> )	-	T	X			X	X		
Yellow-root ( <i>Xanthorhiza simplicissima</i> )	-	E		X					
<b>Lichens</b>									
Florida perforate cladonia ( <i>Cladonia perforata</i> )	E	E		X					

Source:

<sup>1</sup> USFWS, 2019

<sup>2</sup> FWC, 2019; FNAI, 2019; Tyndall AFB, 2015

AFB = Air Force Base; C = Candidate; DPS = Distinct Population Segment; E = Endangered; MOA = Military Operations Area; PT = Proposed Threatened; S/A = Similarity of Appearance (removes federal agency responsibilities under Section 7 of the Endangered Species Act); SSC = Species of Special Concern; T = Threatened