AIR QUALITY SUPPORTING DOCUMENT

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ACRONYMS AND ABBREVIATIONS

%	percent
ACAM	Air Conformity Applicability Model
AFB	Air Force Base
AFE	above field elevation
AGE	aerospace ground equipment
AGL	above ground level
AS	average air speed
CO ₂ e	carbon dioxide equivalent
CY	calendar year
DAF	Department of the Air Force
EIS	Environmental Impact Statement
FD	flight distance
ft	foot/feet
fps	foot/feet per second
GCR	General Conformity Rule
GHG	greenhouse gas
kt	knot
LTO	landing and takeoff
MSL	mean sea level
ROAA	Record of Air Analysis
ROCA	Record of Conformity Analysis
sec	second(s)
SIP	State Implementation Plan
ST	segment time
TIM	Time in Mode
U.S.	United States
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

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AIR QUALITY SUPPORTING DOCUMENT

1.0 Introduction

This document describes the methods used to estimate construction and operational air emissions in the Environmental Impact Statement (EIS) for the proposed 492nd Special Operations Wing (492 SOW) Beddown at Davis-Monthan Air Force Base (AFB). The Proposed Action would require construction activities at Davis-Monthan AFB and would include aircraft operations within the base region, in nearby airspaces and ranges, and along flight routes between these locations and Davis-Monthan AFB.

Under the No Action Alternative, the remaining A-10 aircraft based at Davis-Monthan AFB would be retired and would cease to operate in the region. The analysis also estimates decrease in emissions for this scenario.

2.0 Emission Calculation Methods

Emissions associated with the project alternatives were evaluated in accordance with the tiered approach outlined in the *DAF* [Department of the Air Force] *Air Quality Environmental Impact Analysis Process (EIAP) Guide - Fundamentals, Volume 1 of 2* (AFCEC/CZTQ, 2023). The first step of this approach involved conducting an assessment to determine if a proposed action is exempt from air quality analyses. The Proposed Action is not subject to any categorical exclusion or exemption identified in the General Conformity Rule (GCR). Therefore, this EIS analysis performs a quantitative assessment (Tier II). The Tier II assessment requires a formal evaluation of air impacts based on quantification of annual net total direct and indirect emissions of pollutants of concern.

The analysis used the DAF Air Conformity Applicability Model (ACAM) Version 5.0.23a to estimate construction and/or operational emissions from the project alternatives (Solutio Environmental, 2022). The ACAM provides a level of consistency with respect to emissions factors and calculations. Emissions considered in the analysis include the following:

- Volatile organic compounds (VOCs)
- Carbon monoxide
- Nitrogen oxides
- Sulfur dioxide
- Particulate matter less than 10 microns in diameter
- Particulate matter less than 2.5 microns in diameter
- Lead
- Carbon dioxide equivalent (CO₂e)

The ACAM also identifies whether a project region of analysis is in nonattainment, maintenance, or attainment of the National Ambient Air Quality Standards for purposes of defining emission indicator thresholds to determine the significance of projected air quality impacts. To estimate emissions that would result from the proposed use of munitions by aircraft within project training ranges, the analysis used emission factors developed by the United States (U.S.) Environmental Protection Agency (USEPA) (USEPA, 2024).

The following sections provide details on the assumptions and methods used in the estimation of potential construction and/or operational emissions. Attachment 1 of this document presents outputs of the emissions estimates for each project activity.

2.1 Calculations for Construction

The ACAM evaluates emissions from the following types of construction activities:

- Demolition
- Site grading
- Trenching/excavation
- Building construction
- Architectural coating
- Paving

Sources of air emissions associated with these activities include nonroad construction equipment, on-road trucks and worker vehicles, fugitive dust, and VOCs from architectural coatings and asphalt pavement off-gassing.

The Proposed Action would require the construction of operational, maintenance, and base support facilities, as identified in Chapter 2 of the EIS. Construction activity data in terms of building demolition/renovation/construction volumes, areas of pavement construction, and areas of disturbed ground for fugitive dust were used as inputs to the ACAM. The air quality analysis assumed that the proposed demolition activities would occur in 2025. To provide a conservative analysis, it was assumed that all proposed renovation and construction activities would occur in 2026.

2.2 Calculations for Operations

Operation of the 492 SOW Beddown at Davis-Monthan AFB primarily would generate air emissions from (1) MC-130J and OA-1K aircraft operations, (2) MC-130J and OA-1K engine maintenance and testing, (3) aerospace ground equipment (AGE) usage, and (4) privately owned vehicles due to personnel commuting activities. Project aircraft would also operate in nearby airspaces and ranges and along flight routes between these locations and Davis-Monthan AFB. The analysis assumed that the proposed MC-130J and OA-1K missions would reach full operations with resulting emissions in years 2027/2028.

Under the No Action Alternative, operational activities associated with the remaining A-10 detachment would be similar to those evaluated for the Proposed Action: A-10 operations at (1) Davis-Monthan AFB, (2) in nearby airspaces and ranges, and (3) along flight routes between these locations and Davis-Monthan AFB. The analysis assumed that completion of the A-10 retirement action would occur by calendar year (CY) 2026.

The analysis of aircraft operations is limited to operations that would occur within the lowest part of the atmosphere known as the mixing layer, because that is where the release of aircraft emissions would affect ground-level pollutant concentrations. In general, aircraft emissions released above the mixing layer would not appreciably affect ground-level air quality. In accordance with the GCR (40 Code of Federal Regulations Part 93 Subpart B), where the applicable State Implementation Plan (SIP) or Transportation Implementation Plan does not specify a mixing height, the federal agency can use 3,000 feet above ground level (AGL) as a default mixing height. Since the SIP for the locations of proposed activities does not specify a mixing height, the analysis used 3,000 feet AGL as a default mixing height. The ACAM takes this factor into consideration when estimating emissions from aircraft operations at a basing location, such as a landing and takeoff (LTO) cycle.

Since the altitude floors of some airspaces evaluated in this EIS are at or above 3,000 feet AGL, proposed aircraft operations would not substantially affect ground-level air quality in these areas and therefore

were not considered in the air quality analysis (although they are evaluated in the project noise analysis). These airspaces include the Ruby, Sells, Jackal (not Jackal Low), and Outlaw Military Operations Areas.

The ACAM does not have the OA-1K aircraft in its inventory. Therefore, the U-28A aircraft was chosen as a best-fit surrogate, which has a single PT6A-67B turboprop engine rated at 1,200 horsepower or slightly below 1,434 horsepower rated for the PT6A-67AG engine in the OA-1K.

Flight operations (including arrivals, departures, patterns, and within airspaces and ranges) for project and A-10 aircraft were derived by utilizing the same site-specific operational data as the project noise impact analysis. Both analyses (i.e., noise and air quality) factor in the number and type of operations, the location of operations, aircraft engine power settings, and other relevant details of the affected environment, the Proposed Action, and alternatives necessary to produce a consistent determination of environmental consequences and anticipated mitigations. The analysis of LTOs at Davis-Monthan AFB was based on the USEPA Time In Mode (TIM) Model and site-specific representative TIM cycles. Representative TIM cycles factored in weighted frequency and times in each mode of flight operations (i.e., TIMs) that occur at or below 3,000 feet AGL, based on the site-specific flight profiles developed and the projected frequency of use of each flight profile. The Air Force Civil Engineer Center provided the TIM cycle information for each aircraft type evaluated in the air quality analysis.

To estimate total greenhouse gas (GHG) emissions that would occur from the No Action Alternative and Proposed Action, the analysis included aircraft operations within the immediate Davis-Monthan AFB project region (LTOs and closed patterns), plus aircraft sorties between Davis-Monthan AFB and affected airspaces and training areas and operations within these areas, regardless of aircraft altitude.

Calculations for each aircraft operation showing the time-weighted average assigned to each flight pattern based on the TIM and its percentage of use, consistent with the operational data used throughout this analysis, are available on the project website at <u>http://www.492sow-beddown-eis.com</u>. The following section includes discussion of example methodologies and calculations used to derive the time-weighted average TIMs for flight operations at Davis-Monthan AFB.

Standardized Procedures for Deriving Landing and Takeoff Cycles from Noise Profiles

Dependent on the data collection methodology, a potential to create a substantial amount of error exists. Therefore, a technical/statistical evaluation of the collection method must be performed to demonstrate the validity of the calculated values. This evaluation must include identification and propagation of errors associated with the data collection methodology, extrapolation and interpolation methodologies, and calculations.

A flight profile describes altitude values in feet. These values sometimes are presented as above field elevation (AFE), AGL, or mean sea level (MSL). AFE and AGL values are equal, and MSL values can be adjusted to AFE values by subtracting the elevation of the airfield from the MSL value.

Step 1, Identify Flight Operations: In collecting noise data, several flight patterns are identified that are typical to the specific aircraft under evaluation. These typical patterns are usually summarized in a table that identifies parameters required to derive representative LTO and touch-and-go cycles.

Example Table From a Noise Modeling Operational Data Description Document

15A RC F-3	4632		Days	# of Flying Weeks per year	(Y for Year, M for Month, W for Weedk, or D for	Patterns per Sortie	Annual Departures	Annual Arrivals	Annual Pattern Operations	Total Annual Operations
	4032	AERC	365	52	Doy)	0.25	4632	4632	2316	11580
		4,632 sorties per year. 25% of arriva an AFB Operation Type Distribution	ls will do a clo	sed pattern (0.2		ortie). IFB Percentages of Op	perations during		light	
	Operation	Type	AFRC F-35A					AFRC		
					Operation	Туре		F-35A		
	(Overhead Break Arrival	15%				Acoustic Day	Acoustic Night		
		Tactical Overhead Break Arrival Tactical Straight-in (VFR)	50%			Overhead Break	0700 to 2200 100%	2200 to 0700	anad	
		Straight-in Arrival (ILS)	10%			Straight-in (ILS)	100%	0%	good good	
	Arrivals	Straight-in Arrival (TACAN)	10%		Arrivals	Straight-in (TACAN)	99%	1%	good	
		Straight-in Arrival (VFR)	5%			Straight-in (VFR)	99%	1%	good	
		PFO Arrival	10%			HITRP	2010	10	3000	
)						
					0	Military	99%	1%	good	
	Descriptions	Military	95%		Departures	Afterburner	99%	1%	good	
	Departures	Afterburner	5%							
			acod)		VFR Pattern	100%	0%	good	
		VFR (Visual) Pattern	87%		Patterns	ILS Pattern	100%	0%	good	
		VFR Outside Downwind Pattern				TACAN Pattern	100%	0%	good	
		PFO Pattern	10%							
	Patterns	Re-entry Pattern	1%							
		ILS Pattern	1%							
		TACAN Pattern	1%							
			good							
	1	1	L		Percen	<mark>t</mark> (Identif	fies th	e relativ	e freq	uency a
								\		
					specifi	c patterr	ı is flo	wn		
					-	•		,		
				-		lontifica	the er	ooific t	minal	flight pa
					i yhe (lo	lentines	me sp	ecine ty	/pical	flight pat
	_				-		-	-		-
	- I									
	L				Onerati	on (Note	- Δrriv	vals incl	ude	
	L					ion (Note				
	L					i <mark>on (Note</mark> akeoff an)

Step 2, Obtain Flight Patterns and Profiles: For each of the specific operations identified in the table (i.e., arrivals, departures, and patterns), compile the noise flight patterns and profiles for each "type" of operation. For example, the departures operation has two types: military departures and afterburner departures (aircraft evaluated in the EIS only operate by military departures; afterburner departures do not apply). Note that a noise flight pattern and profile is often used for the same "type" of operation.

Step 3, Interpolation of Critical Points: This step is performed for each "type" of operation identified in Step 2. The LTO Cycle Model has critical data points that represent the start and end of specific flight modes as defined by the model. Unfortunately, noise profiles do not usually fall on these critical data points; therefore, these critical data points must be extrapolated from the available noise data. Generally, data collected for noise are missing critical data points for takeoff at 500 feet AGL, for climb out at 3,000 feet AGL, and for approach at 3,000 feet AGL. At each of these critical data points, which are missing in a noise profile, the distance (i.e., horizontal), height (i.e., altitude), power setting, and air speed must be approximated. For example, the following approach profile is missing the 3,000-foot AGL point where the approach mode would begin.

	<u>Exa</u>	ample N	Noise Ap	proach Pro	ofile	7	
	Point	Distance (ft)	Height (ft)	Power (% ETR)	Speed (kts)		
í	а	209,442	10000	15	300		
I	b	73,060	1500	35	300		Missing 2,000 ft pritical point
	С	42,864	1500	15	300		Missing 3,000 ft critical point
	d	31,898	1500	35	210		
	е	21,932	1500	50	200		
	f	17,932	1500	15	200		
	g	11,966	1500	60	200		
	h	6,000	300	40	170		
	i	0	50	40	160		

Extrapolation is *estimating* a value by *assuming that existing trends will continue;* however, noise profiles have very few data points from which to suggest any specific trend. Therefore, we must default to the even less precise method of *interpolation* to approximate the needed critical points. Linear interpolation is quick and easy, but this is a very imprecise method. *Linear interpolation error can be substantial* because the error is proportional to the square of the distance between the data points.

By assuming a linear relationship between points (which has been proven to not be true), we can approximate the distance (horizontal), power setting, and air speed for a given missing critical point. In a linear relationship, any point between the two known points can be derived with the point-slope equation of a straight line.

$$y = \frac{y_2 - y_1}{x_2 - x_1} \times (x - x_2) + y_2$$

Therefore, for the previous example, the horizontal distance along flight track (D), power setting (P), and air speed (S) at an altitude (A) of 3,000 AGL can be approximated as follows.

$$D = \frac{D_b - D_a}{A_b - A_a} \times (A - A_b) + D_b$$

 $\boldsymbol{D} = \frac{73060 - 209442}{1500 - 10000} \times (3000 - 1500) + 73060 = \boldsymbol{97}, \boldsymbol{127} \, \boldsymbol{ft}$

$$P = \frac{P_b - P_a}{A_b - A_a} \times (A - A_b) + P_b$$

 $\boldsymbol{P} = \frac{25 - 15}{1500 - 10000} \times (3000 - 1500) + 35 = 31\%$

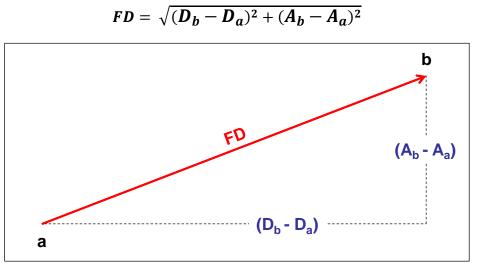
$$S = \frac{S_b - S_a}{A_b - A_a} \times (A - A_b) + S_b$$

$$\mathbf{P} = \frac{300 - 300}{1500 - 10000} \times (3000 - 1500) + 300 = \mathbf{300} \,\mathrm{Kts}$$

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)
а	209,442	10000	15	Variable	300
	97,127	3000	31		300
b	73,060	1500	35	Variable	300
С	42,864	1500	15	Variable	300
d	31,898	1500	35	Variable	210
е	21,932	1500	50	Parallel	200
f	17,932	1500	15	Parallel	200
g	11,966	1500	60	Parallel	200
h	6,000	300	40	Parallel	170
i	0	50	40	Parallel	160

Example Noise Profile with Extrapolation of Critical Point

Step 4, Derive Flight Distances (*FD*): This step is performed for each "type" of operation identified in Step 2. FD is the actual distance an aircraft travels between two points on a flight track (i.e., a segment). The variables used are the horizontal distance along flight track (D) and altitude (A). The altitude values and the distance along flight track values are presented in feet. Therefore, one can calculate approximate FD using the Pythagorean theorem.



Therefore, for the previous example, the FD between the critical point of 3,000 AGL and point "b" can be approximated as follows.

$$FD = \sqrt{(97127 - 73060)^2 + (3000 - 1500)^2} = 24,114 \, ft$$

	1			0		
Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)
а	209,442	10000	15	Variable	300	
	97,127	3000	31		300	
b	73,060	1500	35	Variable	300	24114
с	42,864	1500	15	Variable	300	30196
d	31,898	1500	35	Variable	210	10966
е	21,932	1500	50	Parallel	200	9966
f	17,932	1500	15	Parallel	200	4000
g	11,966	1500	60	Parallel	200	5966
h	6,000	300	40	Parallel	170	6085
i	0	50	40	Parallel	160	6005

Example Noise Profile with Derived Flight Distances

Step 5, Convert Air Speed: This step is performed for each "type" of operation identified in Step 2. Noise profiles provide air speed (speed) in knots (kts) at the beginning and end of a segment, so the values must be converted to feet per second (fps), and an average air speed (AS) of the segment must be calculated. The conversion from kts to fps is 1 kt = 1.6878 fps or AS (fps) = AS (kts) x 1.6878 (fps/kts); therefore, AS is calculated with the following equation.

$$AS = \frac{Speed_a + Speed_b}{2} \times 1.6687$$

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)
а	209,442	10000	15	Variable	300		
	97,127	3000	31		300		
b	73,060	1500	35	Variable	300	24114	506
С	42,864	1500	15	Variable	300	30196	506
d	31,898	1500	35	Variable	210	10966	430
e	21,932	1500	50	Parallel	200	9966	346
f	17,932	1500	15	Parallel	200	4000	338
g	11,966	1500	60	Parallel	200	5966	338
h	6,000	300	40	Parallel	170	6085	312
i	0	50	40	Parallel	160	6005	278

Example Noise Profile with Derived Flight Distances and Air Speed

Final

Step 6, Approximate Time to Travel Segment: This step is performed for each "type" of operation identified in Step 2. Once the actual distance traveled between two points on a flight track (i.e., a segment) and AS is determined, the time to travel a specific segment can be approximated. Segment time (ST) is approximated by dividing the segment's FD by the AS of the segment.

$$ST = \frac{FD}{AS}$$

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)
а	209,442	10000	15	Variable	300			
	97,127	3000	31		300			
b	73,060	1500	35	Variable	300	24114	506	47.62
С	42,864	1500	15	Variable	300	30196	506	59.64
d	31,898	1500	35	Variable	210	10966	430	25.48
e	21,932	1500	50	Parallel	200	9966	346	28.80
f	17,932	1500	15	Parallel	200	4000	338	11.85
g	11,966	1500	60	Parallel	200	5966	338	17.67
h	6,000	300	40	Parallel	170	6085	312	19.49
i	0	50	40	Parallel	160	6005	278	21.56

Example Noise Profile with Derived Segment Times

Step 7, TIMs by Altitude Method: This step is performed for each "type" of operation identified in Step 2. The LTO cycle provides a basis for calculating aircraft emissions. According to USEPA guidance (EPA420-R-92-009 and EPA-450/3-78-117),

"During each mode of operation, the aircraft engines operate at a fairly standard power setting for a given aircraft category. Emissions for one complete cycle for a given aircraft can be calculated by knowing emission factors for specific aircraft engines at those power settings. Then, if the activity of all aircraft in the modeling zone can be determined for the inventory period, the total emissions can be calculated."

Step 7a, Derive TIMs for Specific Noise Flight Profiles Based on Altitudes: For each mode of flight operations represented in a noise flight profile (i.e., takeoff, climb out, and approach), add all STs that are associated with each specific mode as defined by altitude only.

- Takeoff TIM = time to fly from 0 feet (end of runway) to 500 feet (start of climb out mode)
- Climb Out TIM = time to fly from 500 feet (after takeoff mode) to 3,000 feet (mixing height)
- Approach TIM = time to fly from 3,000 feet to 0 feet (landing)

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)	
а	0	0	75	75% ETR	0				
b	3,000	0	100	Variable	150	3000	253	11.85	
С	3,500	7	100	Mil	174	500	273	1.83	Take Off = 33 sec
d	10,000	250	100	Variable	300	6505	400	16.26	
	11,582	500	100		305	1601	510	3.14	2
е	27,400	3000	95	Variable	350	16015	552	28.99	Climbout= 29 sec
f	53,624	10000	35	Variable	350				
g	200,000	10000	35	Variable	350				

Example Noise Profile with Derived Takeoff and Climb Out TIMs

Example Noise Profile with Derived Approach TIM

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)	
а	209,442	10000	15	Variable	300				
	97,127	3000	31		300				
b	73,060	1500	35	Variable	300	24114	506	47.62	
С	42,864	1500	15	Variable	300	30196	506	59.64	
d	31,898	1500	35	Variable	210	10966	430	25.48	
e	21,932	1500	50	Parallel	200	9966	346	28.80	Annroach = 222 cos
f	17,932	1500	15	Parallel	200	4000	338	11.85	Approach = 232 sec
g	11,966	1500	60	Parallel	200	5966	338	17.67	
h	6,000	300	40	Parallel	170	6085	312	19.49	
i	0	50	40	Parallel	160	6005	278	21.56)

NOTE: Noise flight profiles do not include taxi-in and taxi-out data; therefore, taxi TIMs cannot be derived from noise profiles.

For each operation type identified in Step 1, tabulate the TIMs by mode derived in this step.

			Arrivals			Depa	rtures
Mode	Overhead Break Arrival Lead (F35AO03)	Overhead Break Arrival - Wingman (F35AO04)	Straight in IFR Arrival (F35AA01)	straight in VFR Arrival (F35AA06)	PFO Arrival (F35AS01)	Mil Departure (F35ADM01)	Afterburner Departure (F35ADA01)
Takeoff Afterburner	0	0	0	0	0	0	30.85
Takeoff Military	0	0	0	0	0	33.08	27.23
Climb Out	0	0	0	0	0	28.99	0
Approach	217	232	120	230	34	0	0
Taxi/Idle Out/In	0	0	0	0	0	0	0
Frequency Flown =	15%	50%	20%	5%	10%	95%	5%

Example of Operation Type TIMs Tabulated by Modes

Step 7b, Derive Overall Representative TIMs Based on Altitudes: For each operation type identified in Step 1 and tabulated in Step 7a, calculate the percent-weighted representative TIMs for each mode (i.e., operation) by multiplying the time spent in a specified mode by the percent (i.e., frequency) the aircraft is flown in that specified mode for each operation type (i.e., profile).

$TIM_{Mode_{Type}} = time spent in a mode for a specific operation type$ = $TIM_{Mode_{Type}} \times Percent_{Type}$

For example, calculate the TIMs for the approach mode (using the values in the previous table).

$$TIM_{Approach_{F354003}} = 217 \times 15\% = 32.57 \, sec$$

Then, the representative TIMs are derived by adding all percent-weighted representative TIMs for each mode.

Representative
$$TIM_{Mode} = \sum TIM_{Mode_{Type}}$$

For example, calculate the representative TIMs for the approach mode (using the values in the following table).

```
Representative TIM<sub>Approach</sub> = 32.57 + 116.06 + 23.94 + 11.51 + 3.39 = 187.47 sec
```

			Arrivals			Depa	rtures	Noise LTO
Mode	Overhead Break Arrival Lead (F35AO03)	Overhead Break Arrival - Wingman (F35AO04)	Straight in IFR Arrival (F35AA01)	straight in VFR Arrival (F35AA06)	PFO Arrival (F35AS01)	Mil Departure (F35ADM01)	Afterburner Departure (F35ADA01)	Cycle Contributions
Takeoff Afterburner	0.00	0.00	0.00	0.00	0.00	0.00	1.54	1.54
Takeoff Military	0.00	0.00	0.00	0.00	0.00	31.42	1.36	32.79
Climb Out	0.00	0.00	0.00	0.00	0.00	27.54	0.00	27.54
Approach	32.57	116.06	23.94	11.51	3.39	0.00	0.00	187.47
Taxi/Idle Out/In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Derived	Represe	entative 1	TIMs —	

Example of Weighted Times Based on Noise Profiles (seconds)

NOTE: The derived representative TIMs do not include a TIM for the Taxi/Idle Out/In mode. Therefore, the existing Taxi/Idle Out/In value must be used.

Step 8, TIMs by Power Setting Method: This step is performed for each "type" of operation identified in Step 2. This method is a modification of the USEPA method (EPA420-R-92-009 and EPA-450/3-78-117) described in Step 7. In this case, the altitudes are ignored except for 3,000 feet AGL, which is used to identify the end of a Climb Out and the beginning of the approach. Instead of altitudes to define the modes for flight operations, the engine's percent thrust range is used.

- Taxi/Idle Out/In TIM = time flown within the range of 0 to 18.5 percent thrust below 3,000 feet AGL
- Approach TIM = time flown within the range of 18.5 to 50 percent thrust below 3,000 feet AGL
- Climb Out TIM = time flown within the range of 50 to 92.5 percent thrust below 3,000 feet AGL
- Military Takeoff TIM = time flown within the range of 92.5 to 105 percent thrust below 3,000 feet AGL
- Afterburner (AB) Takeoff TIM = time flown within the range of 105 to 150 percent thrust below 3,000 feet AGL

Step 8a, Derive TIMs for Specific Noise Flight Profile Based on Power Settings: For each mode of flight operations represented in a noise flight profile (i.e., takeoff, climb out, and approach), add all STs that are associated with each specific mode as defined by percent thrust range only.

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)	
а	0	0	75	75% ETR	0				
b	3,000	0	100	Variable	150	3000	253	11.85	← Millitary Take Off
с	3,500	7	100	Mil	174	500	273	1.83	← Millitary Take Off
d	10,000	250	100	Variable	300	6505	400	16.26	← Millitary Take Off
	11,582	500	100		305	1601	510	3.14	← Millitary Take Off
е	27,400	3000	95	Variable	350	16015	552	28.99	← Millitary Take Off
f	53,624	10000	35	Variable	350				← Climbout
g	200,000	10000	35	Variable	350				← Climbout

Example Noise Profile with Derived Takeoff and Climb Out TIMs

Note, that in this scenario, the STs for climb out mode are blank (i.e., 0.0 value) because the climb out power range starts above 3,000 feet AGL.

For each operation type identified in Step 1, tabulate the TIMs by mode that were derived in this step.

Example of Operations Type TIMs Tabulated by Mode

					Arrivals			Depai	tures
Mode	% Thrust Range		Overhead Break Arrival Lead (F35AO03)	Overhead Break Arrival - Wingman (F35AO04)	Straight in IFR Arrival (F35AA01)	straight in VFR Arrival (F35AA06)	PFO Arrival (F35AS01)	Mil Departure (F35ADM01)	Afterburner Departure (F35ADA01)
	>	<u><</u>							
Takeoff Afterburner	105	150	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Takeoff Military	92.5	105	0.0	0.0	0.0	0.0	0.0	62.1	48.4
Climb Out	50	92.5	17.7	17.7	0.0	0.0	0.0	0.0	0.0
Approach	18.5	50	128.0	143.0	119.7	230.3	0.0	0.0	0.0
Taxi/Idle Out/In	0	18.5	71.5	71.5	0.0	0.0	33.9	0.0	0.0
Frequency Flown =			15%	50%	20%	5%	10%	95%	5%

Step 8b, Derive Overall Representative TIMs Based on Power Settings: For each operation type identified in Step 1 and tabulated in Step 7a, calculate the percent-weighted representative TIMs for each mode (operation) by multiplying the time spent in a specified mode by the percent (frequency) the aircraft is flown in that specified mode for each operation type (profile).

$TIM_{Mode_{Type}} = time \ spent \ in \ a \ mode \ for \ a \ specific \ operation \ type \\ = \ TIM_{Mode_{Type}} \times \ Percent_{Type}$

For example, calculate the TIMs for the approach mode (using the values in the previous table).

 $TIM_{Approach_{F35A003}} = 128 \times 15\% = 19.2 sec$

The representative TIMs are then derived by adding all percent-weighted representative TIMs for each mode.

Representative
$$TIM_{Mode} = \sum TIM_{Mode_{Type}}$$

For example, calculate the representative TIMs for the approach mode (using the values in the following table).

Representative $TIM_{Approach} = 19.2 + 71.5 + 23.9 + 11.5 = 126.1$ sec

Representative TIM_{Mode} = (Σ TIM_{segement}) x Percent_{Mode}

Example of Weighted Times Based on Noise Profiles (seconds)

				Arrivals					Departures		Noise LTO
Mode	% Thrus	st Range		Overhead Break Arrival Lead (F35AO03)	Overhead Break Arrival - Wingman (F35AO04)	Straight in IFR Arrival (F35AA01)	straight in VFR Arrival (F35AA06)	PFO Arrival (F35AS01)	Mil Departure (F35ADM01)	Afterburner Departure (F35ADA01)	Cycle Contributions
	>	<u><</u>									
Takeoff Afterburner	105	150] [0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
Takeoff Military	92.5	105] [0.0	0.0	0.0	0.0	0.0	59.0	2.4	61.4
Climb Out	50	92.5] [2.7	8.8	0.0	0.0	0.0	0.0		11.5
Approach	18.5	50] [19.2	71.5	23.9	11.5	0.0	0.0	0.0	126.1
Taxi/Idle Out/In	0	18.5		10.7	35.7	0.0	0.0	3.4	0.0	0.0	49.9
Derived Representative TIMs											

Step 9, Derive Overall Average Representative TIMs: Given there are two viable methodologies for deriving representative LTO Cycle TIMs, the last step is to assume both methods are equally valid. Therefore, the TIMS for a representative LTO Cycle are derived by simply averaging the TIM values.

$Representative TIM = \frac{(TIM by Altitude Method + TIM by Power Setting Method)}{2}$

For example, calculate the representative TIMs for the approach mode (using the previous example values).

Representative
$$TIM_{Approach} = \frac{(187 + 126)}{2} = 157 \ sec = 2.61 \ min$$

3.0 Organization Of Document Attachments - Emissions Data

This document includes the following attachments that present construction and operational emissions data and estimates in ACAM summary and detail reports:

- Attachment 1-A: A-10 Operations at Davis-Monthan Air Force Base (AFB) Record of Air Analysis (ROAA) Summary Report and Detail Report
- Attachment 1-B: A-10 Operations within Davis-Monthan AFB Regional Airspaces Record of Conformity Analysis (ROCA) Summary Report and Detail Report
- Attachment 1-C: 492nd Special Operations Wing (492 SOW) Beddown Construction and Aircraft Operations at Davis-Monthan AFB ROAA Summary Report and Detail Report
- Attachment 1-D: 492 SOW Beddown Aircraft Operations within Davis-Monthan AFB Regional Airspaces ROCA Summary Report and Detail Report
- Attachment 1-E: Total Greenhouse Gas (GHG) Emissions for (1) A-10 Operations No Action Alternative and (2) Total GHG Emissions for the 492 SOW Beddown Proposed Action Summary and Detail Reports
- Attachment 1-F: GHG Emissions Reports (1) Total GHG Emissions for A-10 Operations No Action Alternative and (2) Total GHG Emissions for the 492 SOW Beddown Proposed Action

- Attachment 1-G: Emissions Estimates for Munitions Usages Spreadsheet Table for Munitions Usages for A-10 and 492 SOW Beddown Aircraft Operations within Affected Training Areas
- Attachment 1-H: Estimates of Time In Mode Data for Aircraft Operations at (1) Davis-Monthan AFB, (2) Affected Airspaces and Training Areas, and (3) Aircraft Sorties Between Davis-Monthan AFB and Affected Airspaces and Training Areas and Operations within these Areas, Regardless of Aircraft Altitude

The ACAM summary reports include general information and summaries of total CY emissions for each analysis scenario. The ACAM detail reports include specific information on construction and/or operational source activities, emission factors, and emission calculation methods. The attachments identified above are available on the project website at <u>http://www.492sow-beddown-eis.com/</u>.

3.1 Organization of Construction Emissions Data

The ACAM detail reports for the 492 SOW Beddown action present sections on construction projects that include emissions data for one or more of the following activities:

- General Information
- Construction/Demolition
- Trenching/Excavating Phase
- Building Construction Phase
- Architectural Coatings Phase
- Site Grading Phase
- Paving Phase

3.2 Organization of Operations Emissions Data

The ACAM detail reports for Davis-Monthan AFB contain operations emissions data for the A-10 and 492 SOW Beddown scenarios. These data occur in separate sections titled Aircraft and they include the following information:

- General Information and Timeline Assumptions
- Aircraft and Engines
- Flight Operations
- Auxiliary Power Unit (APU)
- Aircraft Engine Test Cell
- AGE

Each ACAM detail report also includes a section for Personnel, which includes emissions calculations for personnel commuter activities.

3.3 Organization of GHG Emissions Data

The GHG emissions reports include general information for each analysis scenario, definitions for CO_{2e} , and the GHG threshold of insignificance for use in National Environmental Policy Act air quality analyses. The reports summarize total CY CO_{2e} emissions for each project alternative, in addition to the following:

- The most recent CO₂e emissions inventories for the United Stated and State that encompasses the Proposed Action (Arizona)
- A Relative Significance Assessment that compares total CO₂e emissions from the project alternative to the global, United States, and State CO₂e emissions inventories

4.0 References

- AFCEC/CZTQ. (2023). DAF Air Quality Environmental Impact Analysis Process (EIAP) Guide Fundamentals, Volume 1 of 2. Air Force Civil Engineer Center, Compliance Technical Support Branch.
- Solutio Environmental, Inc. (2022). USAF Air Conformity Applicability Model (ACAM). Version 5.0.23a. Available online: <u>https://aqhelp.com/acam.html</u>.
- USEPA. (2024). AP-42: Compilation of Air Emissions Factors from Stationary Sources. Chapter 15 -Ordnance Detonation. Available online: <u>https://www.epa.gov/air-emissions-factors-and-</u> quantification/ap-42-compilation-air-emissions-factors-stationary-sources.

ATTACHMENT 1-A

A-10 Operations at Davis-Monthan Air Force Base (AFB) – Record of Air Analysis (ROAA) Summary Report and Detail Report

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

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

Report generated with ACAM version: 5.0.23a

a. Action Location: Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

f. Point of Contact:

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

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

applicable X not applicable

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

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (hsba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (hsba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators.*

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2026					
Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR			
		Indicator (ton/yr)	Exceedance (Yes or No)		
NOT IN A REGULATORY	AREA				
VOC	-212.111	250	No		
NOx	-305.174	250	No		
СО	-428.679	250	No		
SOx	-18.068	250	No		
PM 10	-60.991	250	No		
PM 2.5	-57.384	250	No		
Pb	0.000	25	No		
NH3	-0.254	250	No		

2027 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR		
		Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	-212.111	250	No	
NOx	-305.174	250	No	
СО	-428.679	250	No	
SOx	-18.068	250	No	
PM 10	-60.991	250	No	
PM 2.5	-57.384	250	No	
Pb	0.000	25	No	
NH3	-0.254	250	No	

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Chris Crabtree, Air Quality Meteorologist Name, Title Aug 02 2024 Date

1. General Information

Action Location Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2026

- Action Purpose and Need:

The purpose of the Proposed Action is to co-locate Air Force Special Operations Command (AFSOC) and Air Force Command units that have the resources required to optimize the DAF special operations and special warfare forces to support the National Defense Strategy (NDS), while maximizing AFSOC's capabilities that provide United States Special Operations Command and combatant commands specialized airpower against the entire range of threats to the United States and our allies/partners. The need for the 492 SOW beddown stems from 2023 AFSOC strategic guidance, which aligns with the 2022 NDS - the strategic guidance emphasizes the AFSOC mission to enable the joint force by delivering AFSOC mission capabilities across the spectrum of competition and conflict.

- Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

- Point of Contact

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

Report generated with ACAM version: 5.0.23a

- Activity List:

Activity Type		Activity Title
2.	Aircraft	Retirement of A-10s - LTOs - No Action Alternative
3.	Aircraft	Retirement of A-10s - Closed Patterns
4.	Personnel	Commuting Activities - Removal of 357 FS and 47 FS Personnel

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? Remove

- Activity Location County: Pima Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: Retirement of A-10s LTOs No Action Alternative

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations include 10,320 landing and take-offs (closed patterns calculoated with a seperate ACAM module).

Activity Start Date	
Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-210.018499
SO _x	-17.961316
NO _x	-303.638691
СО	-405.700001

Pollutant	Emissions Per Year (TONs)
PM 10	-60.480822
PM 2.5	-56.925929
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	
CH ₄	-0.940004	
N ₂ O	-0.185538	

Pollutant	Emissions Per Year (TONs)		
CO_2	-22737.218390		
CO ₂ e	-22816.029422		

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

Pollutant	Emissions Per Year (TONs)	
VOC	-75.586269	
SO _x	-3.972229	
NO _x	-18.330560	
CO	-218.056426	

Pollutant	Emissions Per Year (TONs)
PM 10	-23.973829
PM 2.5	-21.580002
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	
CH_4	-0.500055	
N ₂ O	-0.097561	

Pollutant	Emissions Per Year (TONs)
CO_2	-11892.335332
CO ₂ e	-11933.913809

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	
VOC	-0.181118	
SO _x	-0.037767	
NO _x	-0.272077	
СО	-0.692646	

Pollutant	Emissions Per Year (TONs)
PM 10	-0.168415
PM 2.5	-0.151532
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.004754	CO_2	-113.068618
N ₂ O	-0.000928	CO ₂ e	-113.463933

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

Pollutant	Emissions Per Year (TONs)		
VOC	-134.251112		
SO _x	-13.951320		
NO _x	-285.036055		
CO	-186.950929		

n	na Equipment (AGE) partj:				
Pollutant Emissions Per Year (TONs					
	PM 10	-36.338578			
	PM 2.5	-35.194395			
	Pb	0.000000			
	NH ₃	0.000000			

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.435194	CO ₂	-10731.814440
N ₂ O	-0.087049	CO ₂ e	-10768.651680

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e				
Idle	390.00	0.13	0.03	3203.44	3214.64				
Approach	920.00	0.13	0.03	3203.44	3214.64				
Intermediate	460.00	0.13	0.03	3203.44	3214.64				
Military	2710.00	0.13	0.03	3203.44	3214.64				
After Burn	0.00	0.13	0.03	3203.44	3214.64				

- Aircraft & Engine	Greenhouse	Casses]	Pollutant	Fmission	Factors	(lb/1000lb	fuel)
- Anteratt & Engine	Greennouse	Gasses	гопитант	LIIIISSIOII	ractors	(10/100010	iuei)

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: Flight Operation Cycle Type: Number of Annual Flight Operation Cycles for a	LTO (Landing and Takeoff)	32
Number of Annual Flight Operation Cycles for a Number of Annual Trim Test(s) per Aircraft:		10320 12
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	26.33	
Approach [Approach] (mins):	5.46	
Climb Out [Intermediate] (mins):	0.96	
Takeoff [Military] (mins):	1.25	
Takeoff [After Burn] (mins):	0	

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
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: 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	Operation Hours	Exempt	Designation	Manufacturer					
per Aircraft	for Each LTO	Source?							

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)								
Designation	Fuel Flow	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e

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_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

2.5 Aircraft Engine Test Cell

2.5.1 Aircraft Engine Test Cell Assumptions

Engine Test Cell
 Total Number of Aircraft Engines Tested Annually: 64

- Default Settings Used: Yes

- Annual Run-ups / Test Durations	
Annual Run-ups (Per Aircraft Engine):	1 (default)
Idle Duration (mins):	12 (default)
Approach Duration (mins):	27 (default)
Intermediate Duration (mins):	9 (default)
Military Duration (mins):	12 (default)
After Burner Duration (mins):	0 (default)

2.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

2.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs)

TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000

TestCellPS_{POL}: Aircraft Engine Test Cell 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: Total Number of Engines (For All Aircraft)
ARU: Annual Run-ups (Per Aircraft Engine)
2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

 $TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs) TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) TestCellPS_{INTERMEDIATE}: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

2.6 Aerospace Ground Equipment (AGE)

2.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes
- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 10320

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

- Aerospace Ground Equipment (AGE) (default)

2.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

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

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
MJ-1B	0.0	3.040	0.219	4.780	3.040	0.800	0.776
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
MJ-1B	0.0	0.0	0.0	151.7	152.2
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-2A	0.0	0.0	0.0	184.7	185.3
NF-2	0.0	0.0	0.0	23.7	23.8
A/M32A-60A	0.0	0.0	0.0	237.4	238.2

2.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

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

AGEPOL:Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)AGE:Total Number of Aerospace Ground EquipmentOH:Operation Hours for Each LTO (hour)LTO:Number of LTOsEFPOL:Emission Factor for Pollutant (lb/hr)2000:Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

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

- Activity Title: Retirement of A-10s - Closed Patterns

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations include 1,714 closed patterns.

-	Activity	Start	Date
---	----------	-------	------

Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.394563
SO _x	-0.099940
NO _x	-0.679080
CO	-1.776844

Pollutant	Emissions Per Year (TONs)
PM 10	-0.482420
PM 2.5	-0.434111
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	-0.012581
N ₂ O	-0.002455

Pollutant	Emissions Per Year (TONs)		
CO ₂	-299.206336		
CO ₂ e	-300.252434		

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Í I	Pollutant	Emissions Per Year (TONs)
VOC	-0.394563		PM 10	-0.482420
SO _x	-0.099940		PM 2.5	-0.434111
NO _x	-0.679080		Pb	0.000000
СО	-1.776844		NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.012581	CO_2	-299.206336
N ₂ O	-0.002455	CO ₂ e	-300.252434

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: A-10C

Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

The chart of Engline Steembouse Susses I on a unit Emission I actors (15/100016 fact)								
	Fuel Flow	CH ₄	N_2O	CO ₂	CO ₂ e			
Idle	390.00	0.13	0.03	3203.44	3214.64			
Approach	920.00	0.13	0.03	3203.44	3214.64			
Intermediate	460.00	0.13	0.03	3203.44	3214.64			
Military	2710.00	0.13	0.03	3203.44	3214.64			
After Burn	0.00	0.13	0.03	3203.44	3214.64			

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations		
Number of Aircraft:		32
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles	s for all Aircraft:	1714
Number of Annual Trim Test(s) per Aircra	ift:	0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)	
Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.66
Climb Out [Intermediate] (mins):	0.96
Takeoff [Military] (mins):	0.48
Takeoff [After Burn] (mins):	0

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

11III 10St	
Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0

Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

4. Personnel

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

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

- Activity Title: Commuting Activities - Removal of 357 FS and 47 FS Personnel

- Activity Description:

In FY26, retirement of the 357 FS and 47 FS would remove 969/14 military/civilian personnel at DM.

- Activity Start Date	
Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-1.698271
SO _x	-0.007142
NO _x	-0.855950
СО	-21.202157

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	-0.081841
N ₂ O	-0.034197

4.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel:	969
Civilian Personnel:	14
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)

5 Days Per Week (default)
5 Days Per Week (default)
5 Days Per Week (default)
4 Days Per Week (default)
4 Days Per Month (default)

Pollutant	Emissions Per Year (TONs)
PM 10	-0.027440
PM 2.5	-0.024287
Pb	0.000000
NH ₃	-0.254462

Pollutant	Emissions Per Year (TONs)
CO ₂	-2129.716318
CO ₂ e	-2141.949113

4.3 Personnel On Road Vehicle Mixture

- On Road Venicle 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

- On Road Vehicle Mixture (%)

4.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

	CH4	N ₂ O	CO ₂	CO ₂ e	
LDGV	0.01267	0.00485	329.19789	330.95831	
LDGT	0.01235	0.00694	407.55001	409.92671	
HDGV	0.05144	0.02676	924.61645	933.86686	
LDDV	0.04552	0.00068	379.44291	380.78290	
LDDT	0.03328	0.00100	428.74284	429.87432	
HDDV	0.02063	0.16392	1259.79671	1309.16119	
MC	0.11763	0.00308	394.15228	398.01144	

4.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

 $VMT_P = NP * WD * AC$

VMT_P: 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_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

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

V_{POL}: Vehicle Emissions (TONs) VMT_{Total}: Total Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Personnel On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

ATTACHMENT 1-B

A-10 Operations within Davis-Monthan AFB Regional Airspaces – Record of Conformity Analysis (ROCA) Summary Report and Detail Report

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

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

Report generated with ACAM version: 5.0.23a

a. Action Location: Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA; Ajo (Pima County), AZ

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

f. Point of Contact:

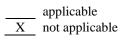
Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no

AIR CONFORMITY APPLICABILITY MODEL REPORT **RECORD OF CONFORMITY ANALYSIS (ROCA)**

net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources. For greater details of this analysis, refer to the Detail ACAM Report.



Conformity Analysis Summary:

2026			
Pollutant	Action Emissions (ton/yr) GENERAL CONFORMITY		CONFORMITY
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	AREA		
VOC	-4.643		
NOx	-59.575		
СО	-25.451		
SOx	-6.096		
PM 10	-16.222		
PM 2.5	-14.578		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	-1.656		
NOx	-15.397		
СО	-8.094		
SOx	-1.591	100	No
PM 10	-4.355		
PM 2.5	-3.914		
Pb	0.000		
NH3	0.000		

2027 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	AREA		
VOC	-4.643		
NOx	-59.575		
СО	-25.451		
SOx	-6.096		
PM 10	-16.222		
PM 2.5	-14.578		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	-1.656		
NOx	-15.397		
СО	-8.094		
SOx	-1.591	100	No

2026

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

PM 10	-4.355	
PM 2.5	-3.914	
Pb	0.000	
NH3	0.000	

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Chris Crabtree, Air Quality Meteorologist
Name, Title

Aug 02 2024 Date

1. General Information

Action Location Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA; Ajo (Pima County), AZ

- Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2026

- Action Purpose and Need:

The purpose of the Proposed Action is to co-locate Air Force Special Operations Command (AFSOC) and Air Force Command units that have the resources required to optimize the DAF special operations and special warfare forces to support the National Defense Strategy (NDS), while maximizing AFSOC's capabilities that provide United States Special Operations Command and combatant commands specialized airpower against the entire range of threats to the United States and our allies/partners. The need for the 492 SOW beddown stems from 2023 AFSOC strategic guidance, which aligns with the 2022 NDS - the strategic guidance emphasizes the AFSOC mission to enable the joint force by delivering AFSOC mission capabilities across the spectrum of competition and conflict.

- Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

- Point of Contact

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

Report generated with ACAM version: 5.0.23a

- Activity List:

11001		
Activity Type		Activity Title
2.	Aircraft	Retirement of A-10s - Fuzzy MOA - No Action Alternative
3.	Aircraft	Retirement of A-10s - Jackal Low MOA - No Action Alternative
4.	Aircraft	Retirement of A-10s - Tombstone A and B MOAs - No Action Alternative
5.	Aircraft	Retirement of A-10s - R-2301E (BMGR) - No Action Alternative

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? Remove

- Activity Location

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

- Activity Title: Retirement of A-10s - Fuzzy MOA - No Action Alternative

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations within the Fuzzy MOA = 1,548.

- Activity Start Date

Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:YesEnd Month:N/AEnd Year:N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-2.670254
SO _x	-1.685346
NO _x	-15.988286
СО	-11.561548

Pollutant	Emissions Per Year (TONs)
PM 10	-4.859451
PM 2.5	-4.367953
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollu
CH_4	-0.212165	CO_2
N_2O	-0.041393	CO ₂ e

Pollutant	Emissions Per Year (TONs)
CO_2	-5045.706310
CO ₂ e	-5063.347318

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	-2.670254
SO _x	-1.685346
NO _x	-15.988286
CO	-11.561548

Pollutant	Emissions Per Year (TONs)
PM 10	-4.859451
PM 2.5	-4.367953
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFT Fight Operations part].					
Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)	
CH ₄	-0.212165		CO_2	-5045.706310	
N ₂ O	-0.041393		CO ₂ e	-5063.347318	

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No **Original Aircraft Name: Original Engine Name:**

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
Idle	390.00	0.13	0.03	3203.44	3214.64
Approach	920.00	0.13	0.03	3203.44	3214.64
Intermediate	460.00	0.13	0.03	3203.44	3214.64
Military	2710.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

Approach [Approach] (mins):

- Flight Operations Number of Aircraft: Flight Operation Cycle Type: Number of Annual Flight Operation Number of Annual Trim Test(s) per		32 1548 0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mod Taxi [Idle] (mins):	e) 0	

0

Climb Out [Intermediate] (mins):	9
Takeoff [Military] (mins):	21
Takeoff [After Burn] (mins):	0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs)

AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs)

AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)

AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs)

AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)

AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location

County: Pima Regulatory Area(s): NOT IN A REGULATORY AREA; Ajo (Pima County), AZ

- Activity Title: Retirement of A-10s - Jackal Low MOA - No Action Alternative

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations within the Jackal Low MOA = 1,548.

_	Activity	Start	Date
-	Activity	Start	Date

Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-1.656175
SO _x	-1.591243
NO _x	-15.397169
СО	-8.093540

Pollutant	Emissions Per Year (TONs)
PM 10	-4.354651
PM 2.5	-3.913682
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.200318	CO_2	-4763.973244
N ₂ O	-0.039082	CO ₂ e	-4780.629245

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-1.656175	PM 10	-4.354651
SO _x	-1.591243	PM 2.5	-3.913682
NO _x	-15.397169	Pb	0.000000
СО	-8.093540	NH ₃	0.000000

Pollutant	utant Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
CH ₄	-0.200318		CO ₂	-4763.973244
N ₂ O	-0.039082		CO ₂ e	-4780.629245

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e	
Idle	390.00	0.13	0.03	3203.44	3214.64	
Approach	920.00	0.13	0.03	3203.44	3214.64	
Intermediate	460.00	0.13	0.03	3203.44	3214.64	
Military	2710.00	0.13	0.03	3203.44	3214.64	
After Burn	0.00	0.13	0.03	3203.44	3214.64	

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: 32 Flight Operation Cycle Type: LFP (Low Flight Pattern) Number of Annual Flight Operation Cycles for all Aircraft: 1548 Number of Annual Trim Test(s) per Aircraft: 0 - Default Settings Used: No - Flight Operations TIMs (Time In Mode) Taxi [Idle] (mins): 0 Approach [Approach] (mins): 0 Climb Out [Intermediate] (mins): 5.36

Takeoff [Military] (mins):	20.36
Takeoff [After Burn] (mins):	0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

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

- Activity Title: Retirement of A-10s - Tombstone A and B MOAs - No Action Alternative

- Activity Description:

n FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations within the Tombstone A and B MOAs = 3,096.

- Activity Start Date

Start Month:1Start Year:2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)	
VOC	-0.151023	
SO _x	-1.346621	
NO _x	-13.466207	
СО	-2.768753	

Pollutant	Emissions Per Year (TONs)
PM 10	-3.347674
PM 2.5	-3.007872
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Poll
CH_4	-0.169523	CO_2
N ₂ O	-0.033074	CO ₂ e

Pollutant	Emissions Per Year (TONs)
CO_2	-4031.606123
CO ₂ e	-4045.701591

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-0.151023	PM 10	-3.347674
SO _x	-1.346621	PM 2.5	-3.007872
NO _x	-13.466207	Pb	0.000000
CO	-2.768753	NH ₃	0.000000

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.169523	CO ₂	-4031.606123
N ₂ O	-0.033074	CO ₂ e	-4045.701591

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	390.00	0.13	0.03	3203.44	3214.64
Approach	920.00	0.13	0.03	3203.44	3214.64
Intermediate	460.00	0.13	0.03	3203.44	3214.64
Military	2710.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: 32 Flight Operation Cycle Type: LFP (Low Flight Pattern) Number of Annual Flight Operation Cycles for all Aircraft: 3096 Number of Annual Trim Test(s) per Aircraft: 0 - Default Settings Used: No - Flight Operations TIMs (Time In Mode) Taxi [Idle] (mins): 0 Approach [Approach] (mins): 0 Climb Out [Intermediate] (mins): 0

9

Takeoff [Military] (mins): Takeoff [After Burn] (mins): 0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60)^{*} (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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 FOC: Number of Flight Operation Cycles (for all aircraft) 2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE IN} + AEM_{IDLE OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE IN}: Aircraft Emissions for Idle-In Mode (TONs) AEMIDLE_OUT: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

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

- Activity Title: Retirement of A-10s - R-2301E (BMGR) - No Action Alternative

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations within R-2301E (BMGR) = 4,128.

- Activity Start Date

Start Month:1Start Year:2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.165118
SO _x	-1.472305
NO _x	-14.723053
СО	-3.027170

Pollutant	Emissions Per Year (TONs)
PM 10	-3.660123
PM 2.5	-3.288607
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	-0.185345
N ₂ O	-0.036161

Pollutant	Emissions Per Year (TONs)
CO_2	-4407.889361
CO ₂ e	-4423.300407

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	-0.165118	PM 10	-3.660123
SO _x	-1.472305	PM 2.5	-3.288607
NO _x	-14.723053	Pb	0.000000
CO	-3.027170	NH ₃	0.000000

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	-0.185345	CO_2	-4407.889361
N ₂ O	-0.036161	CO ₂ e	-4423.300407

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e	
Idle	390.00	0.13	0.03	3203.44	3214.64	
Approach	920.00	0.13	0.03	3203.44	3214.64	
Intermediate	460.00	0.13	0.03	3203.44	3214.64	
Military	2710.00	0.13	0.03	3203.44	3214.64	
After Burn	0.00	0.13	0.03	3203.44	3214.64	

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: Flight Operation Cycle Type:	LFP (Low Flight Pattern)	32
Number of Annual Flight Operation Cycles for a	all Aircraft:	4128
Number of Annual Trim Test(s) per Aircraft:		0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	0	

Takeoff [Military] (mins):7.38Takeoff [After Burn] (mins):0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

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

AEPS_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

ATTACHMENT 1-C

492nd Special Operations Wing (492 SOW) Beddown Construction and Aircraft Operations at Davis-Monthan AFB – ROAA Summary Report and Detail Report

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

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

Report generated with ACAM version: 5.0.23a

a. Action Location:
Base: DAVIS-MONTHAN AFB
State: Arizona
County(s): Pima
Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

c. Project Number/s (if applicable):

d. Projected Action Start Date: 9 / 2025

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

f. Point of Contact: Name: Title: Organization: Email: Phone Number: Chris Crabtree Air Quality Meteorologist Leidos Corporation crabtreec@leidos.com 805-566-6422

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

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

	applicable
Х	not applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (hsba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (hsba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to Level II, Air Quality Quantitative Assessment, Insignificance Indicators.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2025					
Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR			
		Indicator (ton/yr)	Exceedance (Yes or No)		
NOT IN A REGULATORY	AREA				
VOC	0.012	250	No		
NOx	0.103	250	No		
CO	0.146	250	No		
SOx	0.000	250	No		
PM 10	0.071	250	No		
PM 2.5	0.003	250	No		
Pb	0.000	25	No		
NH3	0.000	250	No		

2025

2026

2020						
Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR				
		Indicator (ton/yr)	Exceedance (Yes or No)			
NOT IN A REGULATORY	AREA					
VOC	1.265	250	No			
NOx	4.546	250	No			
СО	5.789	250	No			
SOx	0.010	250	No			
PM 10	8.248	250	No			
PM 2.5	0.143	250	No			
Pb	0.000	25	No			
NH3	0.022	250	No			

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

2027					
Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR			
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)		
NOT IN A REGULATORY	AREA				
VOC	7.496	250	No		
NOx	100.726	250	No		
СО	70.573	250	No		
SOx	5.134	250	No		
PM 10	9.805	250	No		
PM 2.5	8.904	250	No		
Pb	0.000	25	No		
NH3	0.575	250	No		

2028

2020					
Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR			
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)		
NOT IN A REGULATORY	Y AREA				
VOC	22.912	250	No		
NOx	234.858	250	No		
СО	114.108	250	No		
SOx	8.186	250	No		
PM 10	13.346	250	No		
PM 2.5	12.292	250	No		
Pb	0.000	25	No		
NH3	0.575	250	No		

2029 - (Steady State)

Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR	
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	AREA		
VOC	22.912	250	No
NOx	234.858	250	No
СО	114.108	250	No
SOx	8.186	250	No
PM 10	13.346	250	No
PM 2.5	12.292	250	No
Pb	0.000	25	No
NH3	0.575	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Chris Crabtree, Air Quality Meteorologist

Aug 15 2024 Date

Name, Title

1. General Information

Action Location Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

- Project Number/s (if applicable):

- Projected Action Start Date: 9 / 2025

- Action Purpose and Need:

The purpose of the Proposed Action is to co-locate Air Force Special Operations Command (AFSOC) and Air Force Command units that have the resources required to optimize the DAF special operations and special warfare forces to support the National Defense Strategy (NDS), while maximizing AFSOC's capabilities that provide United States Special Operations Command and combatant commands specialized airpower against the entire range of threats to the United States and our allies/partners. The need for the 492 SOW beddown stems from 2023 AFSOC strategic guidance, which aligns with the 2022 NDS - the strategic guidance emphasizes the AFSOC mission to enable the joint force by delivering AFSOC mission capabilities across the spectrum of competition and conflict.

- Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

- Point of Contact

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

Report generated with ACAM version: 5.0.23a

- Activity List:

Activity Type Activity Title		Activity Title
2.	Construction / Demolition	Demolish Buildings 4809 and 4826
3.	Construction / Demolition	Renovate Existing Buildings/Infrastructure
4.	Construction / Demolition	Construct Installation Communications Center and STS Squadron
		Operations Complex
5.	Construction / Demolition	Construct 2-Bay MC-130J Hangar and Maintenance
6.	Construction / Demolition	Construct Parking Area for the STS Squadron Operations Complex
7.	Aircraft	MC-130J - LTOs - Proposed Action Alternative
8.	Aircraft	MC-130Js - Closed Patterns - Proposed Action Alternative
9.	Aircraft	OA-1K - LTOs - Proposed Action Alternative
10.	Aircraft	OA-1K - Closed Patterns - Proposed Action Alternative
11.	Personnel	Commuting Activities - AFSOC Personnel - Proposed Action Alternative

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

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

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

- Activity Title: Demolish Buildings 4809 and 4826

- Activity Description:

Buildings 4809/4826 are 13,800/2,243 square feet (SF) and 20 feet high. Assumed this is the first proposed construction activity that will occur before the end of CY2025.

- Activity Start Date

Start Month:9Start Month:2025

- Activity End Date

Indefinite:	False
End Month:	10
End Month:	2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.011846
SO _x	0.000210
NO _x	0.103302
СО	0.146129

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.000886
N ₂ O	0.000711

Pollutant	Total Emissions (TONs)
PM 10	0.070954
PM 2.5	0.003287
Pb	0.000000
NH ₃	0.000443

Pollutant	Total Emissions (TONs)
CO ₂	24.445210
CO ₂ e	24.679308

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.000886
N ₂ O	0.000711

Pollutant	Total Emissions (TONs)
CO ₂	24.445210
CO ₂ e	24.679308

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

Phase Start Date	
Start Month:	9
Start Quarter:	1
Start Year:	2025

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

2.1.2 Demolition Phase Assumptions

- General Demolition Information
 Area of Building to be demolished (ft²): 16043
 Height of Building to be demolished (ft): 20
- Default Settings Used: Yes
- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd ³):	20 (default)
Average Hauling Truck Round Trip Commute (mile):	20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

VOC SO _x NO _x CO PM 10	PM 2.5

Emission Factors	0.43930	0.00743	3.63468	4.34820	0.10060	0.09255
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	CH ₄	N_2O	CO ₂	CO ₂ e		
Emission Factors	0.02333	0.00467	575.01338	576.98668		
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	CH ₄	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02159	0.00432	532.17175	533.99803		
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]					
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02149	0.00430	529.86270	531.68105		

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.30142	0.00112	0.14251	4.08808	0.00416	0.00368	0.05175
LDGT	0.25342	0.00139	0.19236	3.68952	0.00487	0.00431	0.04344
HDGV	0.89996	0.00309	0.67317	10.90787	0.02123	0.01878	0.09292
LDDV	0.09356	0.00129	0.16316	6.10700	0.00348	0.00320	0.01646
LDDT	0.20346	0.00147	0.52838	5.86403	0.00574	0.00528	0.01748
HDDV	0.11675	0.00430	2.63726	1.56466	0.05095	0.04688	0.06590
MC	3.36641	0.00129	0.73953	12.64256	0.02294	0.02029	0.05323

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01412	0.00504	334.09665	335.94916
LDGT	0.01438	0.00725	415.07038	417.58861
HDGV	0.05477	0.02655	921.28340	930.55521
LDDV	0.04541	0.00068	381.81680	383.15416
LDDT	0.03408	0.00100	434.38854	435.53875
HDDV	0.02100	0.16245	1278.56719	1327.50121
MC	0.11928	0.00310	394.04060	397.94562

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (0.00042 * BA * BH) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft³)
BA: Area of Building to be demolished (ft²)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment

WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft²)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location

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

- Activity Title: Renovate Existing Buildings/Infrastructure

- Activity Description:

The Proposed Action would renovate 28 existing buildings/infrastructure units onbase. Total SF of these structures = 593,534. Applied a factor of 0.10 to this SF, then input this value into the Building Construction module to simulate the effort needed to complete these proposed renovations. Assumed as a worst-case that all renovations would occur on one year = CY 2026.

- Activity Start Date Start Month: 1

Start Month: 2026

- Activity End Date

Indefinite:	False
End Month:	12
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.274527
SO _x	0.002909
NO _x	1.273751
СО	1.698441

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.011635
N ₂ O	0.005871

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011635
N ₂ O	0.005871

Pollutant	Total Emissions (TONs)
PM 10	0.043521
PM 2.5	0.040030
Pb	0.000000
NH ₃	0.004030

Pollutant	Total Emissions (TONs)
CO ₂	305.990347
CO ₂ e	308.030442

Pollutant	Total Emissions (TONs)
CO ₂	305.990347
CO ₂ e	308.030442

3.1 Building Construction Phase

3.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date Start Month:

Start Month:	1
Start Quarter:	1
Start Year:	2026

- Phase Duration Number of Month: 12 Number of Days: 0

3.1.2 Building Construction Phase Assumptions

General Building Construction Information Building Category: Office or Industrial Area of Building (ft²): 59400

Area of building (It-):	39400
Height of Building (ft):	20
Number of Units:	N/A

- Building Construction Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

3.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925			
Forklifts Composite [HP: 82] [LF: 0.2]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287			
Generator Sets Con	posite [HP: 14]	[LF: 0.74]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019			
Tractors/Loaders/B	ackhoes Compo	osite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839			
Welders Composite	[HP: 46] [LF:	0.45]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786			

59

Cranes Composite [HP: 367] [LF: 0.29]			
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite	[HP: 82] [LF: 0.2]			
	CH ₄	N ₂ O	CO_2	CO ₂ e
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Com	posite [HP: 14] [LF: 0	.74]		
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/B	ackhoes Composite [H]	P: 84] [LF: 0.37]		
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite	[HP: 46] [LF: 0.45]			
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02305	0.00461	568.29068	570.24091

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default) Cranes Composite [HP: 367] [LF: 0.29]

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

3.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

 $\begin{array}{l} VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ BA: \ Area \ of \ Building \ (ft^2) \\ BH: \ Height \ of \ Building \ (ft) \\ (0.42 \ / \ 1000): \ Conversion \ Factor \ ft^3 \ to \ trips \ (0.42 \ trip \ / \ 1000 \ ft^3) \\ HT: \ Average \ Hauling \ Truck \ Round \ Trip \ Commute \ (mile/trip) \end{array}$

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{WT}: \ Worker \ Trips \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft²)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft³ to trips (0.38 trip / 1000 ft³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \mbox{ Vehicle Emissions (TONs)} \\ VMT_{VT}: \mbox{ Vehicle Miles Travel (miles)} \\ 0.002205: \mbox{ Conversion Factor grams to pounds} \\ EF_{POL}: \mbox{ Emission Factor for Pollutant (grams/mile)} \\ VM: \mbox{ Worker Trips On Road Vehicle Mixture (\%)} \\ 2000: \mbox{ Conversion Factor pounds to tons} \end{array}$

3.2 Architectural Coatings Phase

3.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date	
Start Month:	9
Start Quarter:	1
Start Year:	2026

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

3.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information Building Category: Non-Residential Total Square Footage (ft²): 10000 Number of Units: N/A
- Architectural Coatings Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

3.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

(vorner 111ps criteria i onatane Zimssion i actors (Brans, mile)							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

3.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

 $VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft²)
800: Conversion Factor square feet to man days (1 ft² / 1 man * day)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft²)
2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area)
0.0116: Emission Factor (lb/ft²)
2000: Conversion Factor pounds to tons

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

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

- Activity Title: Construct Installation Communications Center and STS Squadron Operations Complex

- Activity Description:

Construction of the Installation Communications Center and STS Squadron Operations Complex would occur on bare soil and therefore would require grading, so the analysis combined all of these projects into one module. The combined gross/building footprints = 354,620/297,480 SF. Assumed as a worst-case that all construction would occur in one year = CY2026. Also includes construction of 98,000 SF of parking in the STS Squadron Operations Complex.

- Activity Start Date

Start Month:1Start Month:2026

- Activity End Date

Indefinite:FalseEnd Month:12End Month:2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.593838
SO _x	0.003931
NO _x	1.857698
СО	2.311038

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N ₂ O	0.021032

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N ₂ O	0.021032

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

Phase Start Date	
Start Month:	1
Start Quarter:	1
Start Year:	2026

-

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

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information	
Area of Site to be Graded (ft ²):	354620
Amount of Material to be Hauled On-Site (yd ³):	1000
Amount of Material to be Hauled Off-Site (yd ³):	1000
- Site Grading Default Settings	

- Site Grading Default Settings	
Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day
	Equipment	
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20 (default)Average Hauling Truck Round Trip Commute (mile):20 (default)

 Pollutant
 Total Emissions (TONs)

 PM 10
 7.179421

 PM 2.5
 0.059089

 Pb
 0.000000

 NH₃
 0.010332

Pollutant	Total Emissions (TONs)
CO ₂	495.177394
CO ₂ e	501.859555

Pollutant	Total Emissions (TONs)
CO ₂	495.177394
CO ₂ e	501.859555

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071	
Graders Composite	[HP: 148] [LF:	: 0.41]					
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918	
Other Construction	Equipment Co	mposite [HP: 82	2] [LF: 0.42]				
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546	
Rubber Tired Dozen	rs Composite [H	IP: 367] [LF: 0	.4]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069	
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839	

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02381	0.00476	587.02896	589.04350			
Graders Composite [HP: 148] [LF: 0.41]							
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02153	0.00431	530.81500	532.63663			
Other Construction	Equipment Composite	[HP: 82] [LF: 0.42]					
	CH ₄	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02140	0.00428	527.54121	529.35159			
Rubber Tired Dozen	rs Composite [HP: 367]	[LF: 0.4]					
	CH ₄	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02160	0.00432	532.54993	534.37751			
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02149	0.00430	529.70686	531.52468			

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657

MC 3.35369 0.00129 0.73753 12.49388 0.02294 0.02030 0.05361

- venicie E	- Venicle Exhaust & Worker Trips Greenhouse Gasses Enhission Factors (granis/inne)					
	CH4	N ₂ O	CO ₂	CO ₂ e		
LDGV	0.01267	0.00485	329.19789	330.95831		
LDGT	0.01235	0.00694	407.55001	409.92671		
HDGV	0.05144	0.02676	924.61645	933.86686		
LDDV	0.04552	0.00068	379.44291	380.78290		
LDDT	0.03328	0.00100	428.74284	429.87432		
HDDV	0.02063	0.16392	1259.79671	1309.16119		
MC	0.11763	0.00308	394.15228	398.01144		

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

4.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \mbox{ Vehicle Emissions (TONs)} \\ VMT_{VE}: \mbox{ Vehicle Exhaust Vehicle Miles Travel (miles)} \\ 0.002205: \mbox{ Conversion Factor grams to pounds} \\ EF_{POL}: \mbox{ Emission Factor for Pollutant (grams/mile)} \\ VM: \mbox{ Vehicle Exhaust On Road Vehicle Mixture (%)} \\ 2000: \mbox{ Conversion Factor pounds to tons} \\ \hline \mbox{ Worker Trips Emissions per Phase} \\ VMT_{WT} = WD * WT * 1.25 * NE \end{array}$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

4.2 Trenching/Excavating Phase

4.2.1 Trenching / Excavating Phase Timeline Assumptions

3
1
2026

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

4.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information	
Area of Site to be Trenched/Excavated (ft ²):	3000
Amount of Material to be Hauled On-Site (yd ³):	1000
Amount of Material to be Hauled Off-Site (yd ³):	150

- Trenching Default Settings	
Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day
	Equipment	
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd ³):	20 (default)
Average Hauling Truck Round Trip Commute (mile):	20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]									
	VOC	SO _x	NO _x	СО	PM 10	PM 2.5			
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071			
Other General Indu	Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]								
	VOC	SOx	NO _x	CO	PM 10	PM 2.5			
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404			
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839			

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]									
	CH ₄	N_2O	CO ₂	CO ₂ e					
Emission Factors	0.02381	0.00476	587.02896	589.04350					
Other General Indu	Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]								
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02385	0.00477	587.87714	589.89459					
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]								
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02149	0.00430	529.70686	531.52468					

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

veniere Exhiusse et verier Trips eriteriu i onutune Ennission i uetors (gruns, inne)							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

4.3 Building Construction Phase

4.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date Start Month: 3 Start Quarter: 1 Start Year: 2026
- Phase Duration
 Number of Month: 10
 Number of Days: 0

4.3.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category:	Office or Industrial
Area of Building (ft ²):	297480
Height of Building (ft):	20
Number of Units:	N/A

Building Construction Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	2	7
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

- vendor rrips venice wixture (70)									
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC		
POVs	0	0	0	0	0	100.00	0		

4.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925		
Forklifts Composite	[HP: 82] [LF:	0.2]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287		
Generator Sets Con	posite [HP: 14]	[LF: 0.74]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019		
Tractors/Loaders/B	ackhoes Compo	osite [HP: 84] [LF: 0.37]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839		
Welders Composite [HP: 46] [LF: 0.45]								
	VOC	SO _x	NO _x	СО	PM 10	PM 2.5		
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786		

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]									
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02140	0.00428	527.46069	529.27080					
Forklifts Composite	Forklifts Composite [HP: 82] [LF: 0.2]								
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02138	0.00428	527.09717	528.90603					
Generator Sets Com	posite [HP: 14] [LF: 0	.74]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02305	0.00461	568.32694	570.27730					
Tractors/Loaders/B	ackhoes Composite [Hl	P: 84] [LF: 0.37]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02149	0.00430	529.70686	531.52468					
Welders Composite [HP: 46] [LF: 0.45]									
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02305	0.00461	568.29068	570.24091					

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

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

4.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft²)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs) VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

 $\begin{array}{ll} VMT_{VT}: \mbox{ Vender Trips Vehicle Miles Travel (miles)} \\ BA: \mbox{ Area of Building (ft^2)} \\ BH: \mbox{ Height of Building (ft)} \\ (0.38 / 1000): \mbox{ Conversion Factor ft}^3 \mbox{ trips (0.38 \mbox{ trip } / 1000 \mbox{ ft}^3)} \\ HT: \mbox{ Average Hauling Truck Round Trip Commute (mile/trip)} \end{array}$

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

4.4 Architectural Coatings Phase

4.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date

Start Month:	10
Start Quarter:	1
Start Year:	2026

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

4.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information					
Building Category:	Non-Residential				
Total Square Footage (ft²): 33000				
Number of Units:	N/A				

- Architectural Coatings Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)
- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.4.3 Architectural Coatings Phase Emission Factor(s)

- WOIKCI I	Worker Trips Criteria Fondant Emission Factors (grams/mile)							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃	
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985	
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207	
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192	
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658	
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711	
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657	
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361	

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

 $VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft²)
800: Conversion Factor square feet to man days (1 ft² / 1 man * day)

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft²)
2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area)
0.0116: Emission Factor (lb/ft²)
2000: Conversion Factor pounds to tons

4.5 Paving Phase

4.5.1 Paving Phase Timeline Assumptions

8
1
2026

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

4.5.2 Paving Phase Assumptions

- General Paving Information Paving Area (ft²): 100000
- Paving Default Settings
 Default Settings Used: Yes
 Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025		
Pavers Composite [HP: 81] [LF: 0.42]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872		
Paving Equipment Composite [HP: 89] [LF: 0.36]								

	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388	
Rollers Composite [[HP: 36] [LF: 0	.38]		•			
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156	
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	VOC	SOx	NO _x	СО	PM 10	PM 2.5	
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839	

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]								
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02313	0.00463	570.16326	572.11992				
Pavers Composite []	HP: 81] [LF: 0.42]							
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02133	0.00427	525.80405	527.60847				
Paving Equipment	Composite [HP: 89] [L	F: 0.36]						
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02141	0.00428	527.70636	529.51732				
Rollers Composite [HP: 36] [LF: 0.38]							
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02381	0.00476	586.91372	588.92786				
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02149	0.00430	529.70686	531.52468				

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase $VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location

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

- Activity Title: Construct 2-Bay MC-130J Hangar and Maintenance

- Activity Description:

This facility would comprise a 43,000 SF maintenance facility and a 45,000 SF hanger. No grading required. Assumed as a worst-case that all construction would occur on one year = CY 2026.

-	Activity	Start Date	
	Ctont	Mandles	1

Start Month:	1
Start Month:	2026

- Activity End Date

Indefinite:	False
End Month:	12
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.372436
SO _x	0.002710
NO _x	1.226657
СО	1.531079

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.011074
N ₂ O	0.014805

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N ₂ O	0.014805

5.1 Trenching/Excavating Phase

5.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date Start Month: 1 Start Quarter: 1 Start Year: 2026

Pollutant	Total Emissions (TONs)
PM 10	0.041748
PM 2.5	0.036288
Pb	0.000000
NH ₃	0.007423

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO ₂ e	339.018625

Pollutant	Total Emissions (TONs)
CO ₂	334.330148
CO ₂ e	339.018625

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

5.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information	
Area of Site to be Trenched/Excavated (ft ²):	1000
Amount of Material to be Hauled On-Site (yd ³):	50
Amount of Material to be Hauled Off-Site (yd ³):	50

- Trenching Default Settings	
Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd ³):	20 (default)
Average Hauling Truck Round Trip Commute (mile):	20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

5.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]									
	VOC	SO _x	NO _x	СО	PM 10	PM 2.5			
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071			
Other General Indu	Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]								
	VOC	SOx	NO _x	СО	PM 10	PM 2.5			
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404			
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839			

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 50] [LF: 0.58]							
	CH ₄	N_2O	CO ₂	CO ₂ e			
Emission Factors	0.02381	0.00476	587.02896	589.04350			
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]							

	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02385	0.00477	587.87714	589.89459			
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02149	0.00430	529.70686	531.52468			

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³)

HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \\ \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions (TONs) \\ VMT_{VE}: \ Worker \ Trips \ Vehicle \ Miles \ Travel (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

5.2 Building Construction Phase

5.2.1 Building Construction Phase Timeline Assumptions

hase Start Date	
Start Month: 2	
Start Quarter: 1	
Start Year: 202	26
Start rear: 20.	20

Phase Duration
 Number of Month: 10
 Number of Days: 0

5.2.2 Building Construction Phase Assumptions

- General Building Construction Information				
Office or Industrial				
88000				
50				
N/A				

Building Construction Default Settings
 Default Settings Used: Yes
 Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925		
Forklifts Composite	[HP: 82] [LF:	0.2]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287		
Generator Sets Composite [HP: 14] [LF: 0.74]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019		
Tractors/Loaders/B	ackhoes Compo	osite [HP: 84] [LF: 0.37]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839		
Welders Composite [HP: 46] [LF: 0.45]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786		

Cranes Composite [HP: 367] [LF: 0.29]									
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02140	0.00428	527.46069	529.27080					
Forklifts Composite	Forklifts Composite [HP: 82] [LF: 0.2]								
	CH ₄	N ₂ O	CO_2	CO ₂ e					
Emission Factors	0.02138	0.00428	527.09717	528.90603					
Generator Sets Composite [HP: 14] [LF: 0.74]									
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02305	0.00461	568.32694	570.27730					
Tractors/Loaders/B	ackhoes Composite [H]	P: 84] [LF: 0.37]							
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02149	0.00430	529.70686	531.52468					
Welders Composite	Welders Composite [HP: 46] [LF: 0.45]								
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02305	0.00461	568.29068	570.24091					

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default) Cranes Composite [HP: 367] [LF: 0.29]

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

 $\begin{array}{l} VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ BA: \ Area \ of \ Building \ (ft^2) \\ BH: \ Height \ of \ Building \ (ft) \\ (0.42 \ / \ 1000): \ Conversion \ Factor \ ft^3 \ to \ trips \ (0.42 \ trip \ / \ 1000 \ ft^3) \\ HT: \ Average \ Hauling \ Truck \ Round \ Trip \ Commute \ (mile/trip) \end{array}$

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{WT}: \ Worker \ Trips \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft²)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft³ to trips (0.38 trip / 1000 ft³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \mbox{ Vehicle Emissions (TONs)} \\ VMT_{VT}: \mbox{ Vehicle Miles Travel (miles)} \\ 0.002205: \mbox{ Conversion Factor grams to pounds} \\ EF_{POL}: \mbox{ Emission Factor for Pollutant (grams/mile)} \\ VM: \mbox{ Worker Trips On Road Vehicle Mixture (\%)} \\ 2000: \mbox{ Conversion Factor pounds to tons} \end{array}$

5.3 Architectural Coatings Phase

5.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date	
Start Month:	9
Start Quarter:	1
Start Year:	2026

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

5.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information Building Category: Non-Residential Total Square Footage (ft²): 20000 Number of Units: N/A
- Architectural Coatings Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

5.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

······································							
	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

 $VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft²)
800: Conversion Factor square feet to man days (1 ft² / 1 man * day)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft²)
2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area)
0.0116: Emission Factor (lb/ft²)
2000: Conversion Factor pounds to tons

5.4 Paving Phase

5.4.1 Paving Phase Timeline Assumptions

- Phase Start Date Start Month: 8 Start Quarter: 1 Start Year: 2026
- Phase Duration Number of Month: 0 Number of Days: 3

5.4.2 Paving Phase Assumptions

- General Paving Inform	nation
Paving Area (ft ²):	2000

- Paving Default Settings	
Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6

Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

wormer rin	(vorher Trips vehicle (initial (/v)						
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025
Pavers Composite []	HP: 81] [LF: 0.	.42]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Rollers Composite [HP: 36] [LF: 0	.38]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02313	0.00463	570.16326	572.11992		
Pavers Composite []	Pavers Composite [HP: 81] [LF: 0.42]					
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02133	0.00427	525.80405	527.60847		
Rollers Composite [HP: 36] [LF: 0.38]					
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02381	0.00476	586.91372	588.92786		
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02149	0.00430	529.70686	531.52468		

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711

HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \\ \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)WT: Average Worker Round Trip Commute (mile)1.25: Conversion Factor Number of Construction Equipment to Number of WorksNE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \mbox{ Vehicle Emissions (TONs)} \\ VMT_{VE}: \mbox{ Worker Trips Vehicle Miles Travel (miles)} \\ 0.002205: \mbox{ Conversion Factor grams to pounds} \\ EF_{POL}: \mbox{ Emission Factor for Pollutant (grams/mile)} \\ VM: \mbox{ Worker Trips On Road Vehicle Mixture (\%)} \\ 2000: \mbox{ Conversion Factor pounds to tons} \end{array}$

- Off-Gassing Emissions per Phase

 $VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location

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

- Activity Title: Construct Parking Area for the STS Squadron Operations Complex

- Activity Description:

Estimated footprint for the parking area is 98,000 sf and paved area somewhat smaller.

- Activity Start Date

Start Month:9Start Month:2026

- Activity End Date

Indefinite:	False
End Month:	10
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.024546
SO _x	0.000359
NO _x	0.188328
CO	0.247971

Pollutant	Total Emissions (TONs)
PM 10	0.983277
PM 2.5	0.007706
Pb	0.000000
NH ₃	0.000485

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.001589
N ₂ O	0.000651

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.001589
N ₂ O	0.000651

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date	
Start Month:	9
Start Quarter:	1

Start Quarter:	1
Start Year:	2026

- Phase Duration

Number of Month:1Number of Days:0

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information	
Area of Site to be Graded (ft ²):	98000
Amount of Material to be Hauled On-Site (yd ³):	0
Amount of Material to be Hauled Off-Site (yd ³):	1000

- Site Grading Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day	
	Equipment		
Graders Composite	1	6	
Other Construction Equipment Composite	1	8	
Rubber Tired Dozers Composite	1	6	
Tractors/Loaders/Backhoes Composite	1	7	

- Vehicle Exhaust

Average Hauling Truck Capacity (yd ³):	20 (default)
Average Hauling Truck Round Trip Commute (mile):	20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

Pollutant	Total Emissions (TONs)
CO ₂	41.087446
CO ₂ e	41.321134

Pollutant	Total Emissions (TONs)
CO ₂	41.087446
CO ₂ e	41.321134

- Worker Trips Vehicle Mixture (%)

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

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]										
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918				
Other Construction	Other Construction Equipment Composite [HP: 82] [LF: 0.42]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546				
Rubber Tired Dozen	Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069				
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]										
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839				

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02153	0.00431	530.81500	532.63663		
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02140	0.00428	527.54121	529.35159		
Rubber Tired Dozen	Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]					
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02160	0.00432	532.54993	534.37751		
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	CH4	N ₂ O	CO ₂	CO ₂ e		
Emission Factors	0.02149	0.00430	529.70686	531.52468		

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Vehicle Exhaust On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs) VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date Start Month: 10 Start Quarter: 1 Start Year: 2026

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

6.2.2 Paving Phase Assumptions

- General Paving Information Paving Area (ft²): 80000
- Paving Default Settings
 Default Settings Used: Yes
 Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

6.2.3 Paving Phase Emission Factor(s)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025	
Pavers Composite []	HP: 81] [LF: 0.	.42]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872	
Paving Equipment (Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388	
Rollers Composite [HP: 36] [LF: 0	.38]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156	
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839	

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]							
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02313	0.00463	570.16326	572.11992			
Pavers Composite [HP: 81] [LF: 0.42]							
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02133	0.00427	525.80405	527.60847			
Paving Equipment (Paving Equipment Composite [HP: 89] [LF: 0.36]						
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02141	0.00428	527.70636	529.51732			
Rollers Composite [HP: 36] [LF: 0.38]						
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02381	0.00476	586.91372	588.92786			
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	CH4	N ₂ O	CO ₂	CO ₂ e			
Emission Factors	0.02149	0.00430	529.70686	531.52468			

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

6.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \\ \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location County: Pima

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MC-130J - LTOs - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 14 MC-130Js that would perform 1,600 LTOs to DM.

- Activity Start Date

Start Month:1Start Year:2027

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	3.585420
SO _x	3.076786
NO _x	81.782965
СО	17.849156

Pollutant Emissions Per Year (TONs) PM 10 5.510000 PM 2.5 5.040213 Pb 0.000000 NH₃ 0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.292624
N ₂ O	0.057484

Pollutant	Emissions Per Year (TONs)
CO ₂	7033.550033
CO ₂ e	7058.002543

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

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
VOC	0.073864]	PM 10	4.140309
SO _x	1.599411]	PM 2.5	3.730010
NO _x	13.421199]	Pb	0.000000
СО	5.455483		NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.201346
N ₂ O	0.039283

Pollutant	Emissions Per Year (TONs)
CO_2	4788.426938
CO ₂ e	4805.168435

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.001443
SO _x	0.042954
NO _x	0.387559
СО	0.122258

Pollutant	Emissions Per Year (TONs)
PM 10	0.095523
PM 2.5	0.086048
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.005407	CO ₂	128.598895
N ₂ O	0.001055	CO ₂ e	129.048508

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

Pollutant	Emissions Per Year (TONs)
VOC	3.510113
SO _x	1.434421
NO _x	67.974207
СО	12.271416

10	ia Equipment (AGE) part]:		
Pollutant Emissions Per Year (TO)			
	PM 10	1.274168	
	PM 2.5	1.224155	
	Pb	0.000000	
	NH ₃	0.000000	

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.085870	CO_2	2116.524200
N ₂ O	0.017146	CO ₂ e	2123.785600

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	MC-130J
Engine Model:	AE2100D3
Primary Function:	Transport - Bomber
Aircraft has After burn:	No
Number of Engines:	4

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Fuel Flow	CH ₄	N_2O	CO ₂	CO ₂ e		
Idle	724.00	0.13	0.03	3203.44	3214.64		
Approach	880.00	0.13	0.03	3203.44	3214.64		
Intermediate	1742.00	0.13	0.03	3203.44	3214.64		
Military	2262.00	0.13	0.03	3203.44	3214.64		
After Burn	0.00	0.13	0.03	3203.44	3214.64		

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fue	el)
---	-----

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

 Flight Operations Number of Aircraft: Flight Operation Cycle Type: Number of Annual Flight Operation Cycle Number of Annual Trim Test(s) per Aircra 		16 1600 12
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	13.24	
Approach [Approach] (mins):	3.96	
Climb Out [Intermediate] (mins):	1.44	
Takeoff [Military] (mins):	1.51	
Takeoff [After Burn] (mins):	0	

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
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

7.4 Auxiliary Power Unit (APU)

7.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Turinity I ower child (III c) (aduate)					
Number of APU	Operation Hours	Exempt	Designation	Manufacturer	
per Aircraft	for Each LTO	Source?			

7.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Tuxinary Tower Chit (III C) Criteria Fondault Emission Factors (15/11)							
Designation	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5

			- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)						
Designation	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e				
.4.3 Auxiliary Power	Unit (APU) Forn	nula(s)							
Auxiliary Power Unit (A APU _{POL} = APU * OH * LT		r Year							
APU _{POL} : Auxiliary Po APU: Number of Aux OH: Operation Hours LTO: Number of LTO EF _{POL} : Emission Facto 2000: Conversion Facto	iliary Power Units for Each LTO (hou ls or for Pollutant (lb/l	r)	utant (TONs)						
.5 Aircraft Engine Te	st Cell								
.5.1 Aircraft Engine T	est Cell Assump	tions							
Engine Test Cell Total Number of Airc	eraft Engines Teste	ed Annually:	64						
Default Settings Used:	No								
Annual Run-ups / Test E Annual Run-ups (Per Idle Duration (mins): Approach Duration (n Intermediate Duration Military Duration (m After Burner Duratio	Aircraft Engine): mins): n (mins): ins):	1 12 27 9 12 0							
7.5.2 Aircraft Engine T	est Cell Emissio	n Factor(s)							
See Aircraft & Engines l	Emission Factor(s))							
7.5.3 Aircraft Engine T	est Cell Formula	a(s)							
Aircraft Engine Test Cel FestCellPS _{POL} = (TD / 60)									
TestCellPS _{POL} : Aircrat TD: Test Duration (mi 60: Conversion Factor FC: Fuel Flow Rate (II 1000: Conversion Factor EF: Emission Factor (I	n) minutes to hours b/hr) tor pounds to 1000p		ollutant & Power S	etting (TONs)					

NE: Total Number of Engines (For All Aircraft)

- ARU: Annual Run-ups (Per Aircraft Engine)
- 2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

 $TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)

TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) TestCellPS_{INTERMEDIATE}: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

7.6 Aerospace Ground Equipment (AGE)

7.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 1600

Total Number of	Fotal Number of Operation Hours Exempt		AGE Type	Designation
AGE	for Each LTO	Source?		
1	1	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Air Conditioner	MA-3D - 120hp
1	11	No	Generator Set	A/M32A-86D
1	1	No	Heater	H1
1	3	No	Hydraulic Test Stand	MJ-2A
1	10	No	Light Cart	NF-2
1	0.25	No	Start Cart	A/M32A-60A

- Aerospace Ground Equipment (AGE) (default)

7.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

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

Designation	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
MA-3D - 120hp	7.1	0.053	0.050	4.167	0.317	0.109	0.105
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

The objace of our a Equipment (TOE) of centrouse Gusses Emission Fuetors (IS/III)					
Designation	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
MA-3D - 120hp	7.1	0.0	0.0	160.2	160.8
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-2A	0.0	0.0	0.0	184.7	185.3
NF-2	0.0	0.0	0.0	23.7	23.8
A/M32A-60A	0.0	0.0	0.0	237.4	238.2

7.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

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

AGE_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr) 2000: Conversion Factor pounds to tons

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

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

- Activity Title: MC-130Js - Closed Patterns - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 14 MC-130Js that would perform 5,120 closed patterns at DM.

- Activity Start Date

Start Month: 1 Start Year: 2027

- Activity End Date

Indefinite: Yes **End Month:** N/A **End Year:** N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.061147
SO _x	2.040613
NO _x	17.119035
СО	4.994703

Pollutant	Emissions Per Year (TONs)
PM 10	4.232087
PM 2.5	3.808114
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.256888
N ₂ O	0.050119

Pollutant	Emissions Per Year (TONs)
CO ₂	6109.327408
CO ₂ e	6130.687092

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.061147	PM 10	4.232087
SO _x	2.040613	PM 2.5	3.808114
NO _x	17.119035	Pb	0.000000
CO	4.994703	NH ₃	0.000000

Pollutant	Emissions Per Year (TONs)	 Pollutant	Emissions Per Year (TONs)
CH_4	0.256888	CO ₂	6109.327408
N ₂ O	0.050119	CO ₂ e	6130.687092

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	MC-130J
Engine Model:	AE2100D3
Primary Function:	Transport - Bomber
Aircraft has After burn:	No
Number of Engines:	4

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
Idle	724.00	0.13	0.03	3203.44	3214.64
Approach	880.00	0.13	0.03	3203.44	3214.64
Intermediate	1742.00	0.13	0.03	3203.44	3214.64
Military	2262.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations		
Number of Aircraft:		16
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycles for a	all Aircraft:	5120
Number of Annual Trim Test(s) per Aircraft:		0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	4.17	

Climb Out [Intermediate] (mins):	3.62
Takeoff [Military] (mins):	0.53
Takeoff [After Burn] (mins):	0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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

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

AETRIM: Aircraft Emissions (TONs)

AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs)

AEPSINTERMEDIATE: Aircraft Emissions for Intermediate Power Setting (TONs)

AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs)

AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location County: Pima **Regulatory Area(s):** NOT IN A REGULATORY AREA

- Activity Title: OA-1K - LTOs - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 15 OA-1Ks that would perform 3,000 LTOs to DM. Since ACAM does not have the OA-1K aircraft in its inventory, the analysis chose the U-28A aircraft as a best-fit surrogate, which has a single PT6A-67B turboprop engine rated at 1,200 horsepower or slightly below 1,434 horsepower rated for the PT6A-67AG engine in the OA-1K.

The AGE usages modeled by ACAM for the U-28A and the associated emissions appear to be a substantial overestimate compared to those for the OA-1K.

- Activity Start Date

Start Month:	1
Start Year:	2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	15.392612
SO _x	3.037292
NO _x	134.052463
CO	43.368284

Pollutant	Emissions Per Year (TONs)
PM 10	3.534593
PM 2.5	3.381840
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	P
CH_4	0.204553	CO_2
N_2O	0.040737	CO ₂ e

Pollutant	Emissions Per Year (TONs)
CO ₂	5017.386842
CO ₂ e	5034.645532

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

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
VOC	5.188600	PM	110	0.185369
SO _x	0.236371	PM	1 2.5	0.167048

NO _x	0.926572
СО	16.679614

Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.029756
N ₂ O	0.005805

Pollutant	Emissions Per Year (TONs)
CO ₂	707.662376
CO ₂ e	710.136535

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.018051
SO _x	0.003383
NO _x	0.017753
СО	0.075266

Pollutant	Emissions Per Year (TONs)
PM 10	0.001659
PM 2.5	0.001502
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
CH_4	0.000426		CO ₂	10.127091
N ₂ O	0.000083]	CO ₂ e	10.162498

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

Pollutant	Emissions Per Year (TONs)
VOC	10.185962
SO _x	2.797539
NO _x	133.108138
СО	26.613404

Pollutant	Emissions Per Year (TONs)
PM 10	3.347566
PM 2.5	3.213291
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
CH ₄	0.174371		CO_2	4299.597375
N ₂ O	0.034849]	CO ₂ e	4314.346500

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	U-28A
Engine Model:	PT6A-67B
Primary Function:	General - Turboprop
Aircraft has After burn:	No
Number of Engines:	1

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

An erart & Englise Criteria i ondulit Emission i actors (10/100010 fuer)									
	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24		
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65		
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29		
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23		
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	142.87	0.13	0.03	3203.44	3214.64
Approach	364.17	0.13	0.03	3203.44	3214.64
Intermediate	618.87	0.13	0.03	3203.44	3214.64
Military	681.14	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

 Flight Operations Number of Aircraft: Flight Operation Cycle Type: Number of Annual Flight Operation Cycles for Number of Annual Trim Test(s) per Aircraft: 		15 3000 12
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	21.55	
Approach [Approach] (mins):	7.31	
Climb Out [Intermediate] (mins):	1.35	
Takeoff [Military] (mins):	1.09	
Takeoff [After Burn] (mins):	0	

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
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

9.4 Auxiliary Power Unit (APU)

9.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU	Operation Hours	Exempt	Designation	Manufacturer
per Aircraft	for Each LTO	Source?		

9.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (API	U) Criteria Pol	lutant Emis	sion Fact	ors (lb/hr)			
Designation	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
		C F	· ·				
- Auxiliary Power Unit (API Designation	Fuel Flow	Gasses Em CH4	ission Fac	$\frac{10}{N_2O}$	CO ₂		CO ₂ e
Designation	FUELTIO W	C11 4		1120			
9.4.3 Auxiliary Power Ur	nit (APU) For	mula(s)					
- Auxiliary Power Unit (APU APU _{POL} = APU * OH * LTO		er Year					
APU _{POL} : Auxiliary Powe APU: Number of Auxilia OH: Operation Hours for LTO: Number of LTOs EF _{POL} : Emission Factor f 2000: Conversion Factor	ary Power Units r Each LTO (ho for Pollutant (lb	s our) v/hr)	r Pollutan	t (TONs)			
9.5 Aircraft Engine Test	Cell						
9.5.1 Aircraft Engine Tes	st Cell Assum	ptions					
- Engine Test Cell Total Number of Aircra	ift Engines Tes	ted Annual	l y: 15				
- Default Settings Used:	No						
- Annual Run-ups / Test Du Annual Run-ups (Per A Idle Duration (mins): Approach Duration (mi Intermediate Duration (Military Duration (mins After Burner Duration (ircraft Engine ns): (mins): s):): 1 12 27 9 12 0					
9.5.2 Aircraft Engine Tes	st Cell Emissi	on Factor(s)				
- See Aircraft & Engines En	nission Factor(s)					
9.5.3 Aircraft Engine Tes	st Cell Formu	la(s)					
- Aircraft Engine Test Cell I TestCellPS _{POL} = (TD / 60) * (etting (TONs)			
TestCellPS _{POL} : Aircraft I TD: Test Duration (min) 60: Conversion Factor m FC: Fuel Flow Rate (lb/r 1000: Conversion Factor EF: Emission Factor (lb/	inutes to hours nr) pounds to 1000		per Pollut	ant & Power S	etting (TON	[s)	
NE: Total Number of En							

- Aircraft Engine Test Cell Emissions per Year

 $TestCell = TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN} + TestCellPS_{$

TestCell: Aircraft Engine Test Cell Emissions (TONs) TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) TestCellPS_{INTERMEDIATE}: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

9.6 Aerospace Ground Equipment (AGE)

9.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 3000

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation	
1	10 10			MC-1A - 18.4hp	
1	1	No	Air Conditioner	MA-3D - 120hp	
1	11	No	Generator Set	A/M32A-86D	
1	1	No	Heater	H1	
1	3	No	Hydraulic Test Stand	MJ-2A	
1	10	No	Light Cart	NF-2	
1	0.25	No	Start Cart	A/M32A-60A	

- Aerospace Ground Equipment (AGE) (default)

9.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

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

Designation	Fuel Flow	VOC	SOx	NO _x	CO	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
MA-3D - 120hp	7.1	0.053	0.050	4.167	0.317	0.109	0.105
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
MA-3D - 120hp	7.1	0.0	0.0	160.2	160.8
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-2A	0.0	0.0	0.0	184.7	185.3
NF-2	0.0	0.0	0.0	23.7	23.8
A/M32A-60A	0.0	0.0	0.0	237.4	238.2

9.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

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

AGE_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr) 2000: Conversion Factor pounds to tons

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add
- Activity Location County: Pima

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: OA-1K - Closed Patterns - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 15 OA-1Ks that would perform 300 closed patterns at DM.

- Activity Start Date

Start Month:1Start Year:2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.023092
SO _x	0.014670
NO _x	0.079348
СО	0.167389

Pollutant	Emissions Per Year (TONs)
PM 10	0.006594
PM 2.5	0.005964
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)			
CH ₄	0.001847			
N ₂ O	0.000360			

Pollutant	Emissions Per Year (TONs)			
CO_2	43.920668			
CO ₂ e	44.074225			

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
VOC	0.023092	Р	PM 10	0.006594
SO _x	0.014670	Р	PM 2.5	0.005964
NO _x	0.079348	Р	Ъ	0.000000
СО	0.167389	N	NH ₃	0.000000

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
CH ₄	0.001847		CO ₂	43.920668
N ₂ O	0.000360]	CO ₂ e	44.074225

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	U-28A
Engine Model:	PT6A-67B
Primary Function:	General - Turboprop
Aircraft has After burn:	No
Number of Engines:	1

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e		
Idle	142.87	0.13	0.03	3203.44	3214.64		
Approach	364.17	0.13	0.03	3203.44	3214.64		
Intermediate	618.87	0.13	0.03	3203.44	3214.64		
Military	681.14	0.13	0.03	3203.44	3214.64		
After Burn	0.00	0.13	0.03	3203.44	3214.64		

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: 15 Flight Operation Cycle Type: CP (Close Pattern) Number of Annual Flight Operation Cycles for all Aircraft: 300 Number of Annual Trim Test(s) per Aircraft: 0 - Default Settings Used: No - Flight Operations TIMs (Time In Mode) Taxi [Idle] (mins): 0 Approach [Approach] (mins): 6.2 Climb Out [Intermediate] (mins): 4.74

Takeoff [Military] (mins):	0.43
Takeoff [After Burn] (mins):	0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

11. Personnel

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

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

- Activity Title: Commuting Activities - AFSOC Personnel - Proposed Action Alternative

- Activity Description:

The AFSOC Proposed Action would add 2,119/37/144 military/civilian/contractor personnel to DM.

- Activity Start Date

Start Month:1Start Year:2027

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	3.849865
SO _x	0.016421
NO _x	1.823896
CO	47.728733

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.181239
N ₂ O	0.077689

Pollutant	Emissions Per Year (TONs)
PM 10	0.063118
PM 2.5	0.055791
Pb	0.000000
NH ₃	0.575166

Pollutant	Emissions Per Year (TONs)
CO ₂	4900.121232
CO ₂ e	4927.773503

11.2 Personnel Assumptions

- Number of Personnel	
Active Duty Personnel:	2119
Civilian Personnel:	37
Support Contractor Personnel:	1 44
Air National Guard (ANG) Personnel:	0
Reserve Personnel:	0
 Default Settings Used: Yes Average Personnel Round Trip Commute (m. 1996) 	ile): 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)

11.3 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

11.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

on Roue venere eriteria i onatant Emission i actors (grams/mile)							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26273	0.00109	0.11133	3.78420	0.00397	0.00351	0.04877
LDGT	0.21524	0.00134	0.13531	3.23488	0.00472	0.00417	0.04019
HDGV	0.76835	0.00311	0.53449	9.47042	0.01916	0.01695	0.08978
LDDV	0.08885	0.00127	0.15487	6.37470	0.00367	0.00338	0.01671
LDDT	0.12791	0.00144	0.43608	5.31960	0.00600	0.00552	0.01697
HDDV	0.09284	0.00416	2.27577	1.46813	0.03749	0.03449	0.06709
MC	3.32621	0.00129	0.73577	12.36217	0.02294	0.02030	0.05395

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01214	0.00475	323.73211	325.44824
LDGT	0.01144	0.00671	400.53401	402.81761
HDGV	0.04895	0.02576	926.65228	935.54198
LDDV	0.04559	0.00068	376.92226	378.26346
LDDT	0.03251	0.00100	425.48268	426.59454
HDDV	0.02029	0.16508	1238.44321	1288.14328
MC	0.11616	0.00308	394.24722	398.06873

11.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

 $VMT_P = NP * WD * AC$

VMT_P: 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_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

ATTACHMENT 1-D

492 SOW Beddown Aircraft Operations within Davis-Monthan AFB Regional Airspaces – ROCA Summary Report and Detail Report

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

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: DAVIS-MONTHAN AFB
State: Arizona
County(s): Cochise; Pima; Graham; Santa Cruz
Regulatory Area(s): NOT IN A REGULATORY AREA; Ajo (Pima County), AZ; Nogales, AZ; Douglas (Cochise County), AZ; Paul Spur/Douglas (Cochise County), AZ

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2027

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

f. Point of Contact:

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources. For greater details of this analysis, refer to the Detail ACAM Report.

	applicable
Х	not applicable

Conformity Analysis Summary:

	20)27	
Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATO			
VOC	0.025		
NOx	11.502		
СО	2.439		
SOx	1.345		
PM 10	1.835		
PM 2.5	1.647		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	0.005		
NOx	2.448		
СО	0.519		
SOx	0.286	100	No
PM 10	0.391		
PM 2.5	0.351		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	0.005		
NOx	2.448		
СО	0.519		
SOx	0.286		
PM 10	0.391	100	No
PM 2.5	0.351		
Pb	0.000		
NH3	0.000		
Nogales, AZ			
VOC	0.000	100	No
NOx	0.000	100	No
СО	0.000		
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000		

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NH3	0.000	100	No
Douglas (Cochise County),	AZ		
VOC	0.056		
NOx	25.824		
СО	5.475		
SOx	3.020	100	No
PM 10	4.121		
PM 2.5	3.697		
Pb	0.000		
NH3	0.000		
Paul Spur/Douglas (Cochise	e County), AZ		
VOC	0.056		
NOx	25.824		
СО	5.475		
SOx	3.020		
PM 10	4.121	100	No
PM 2.5	3.697		
Pb	0.000		
NH3	0.000		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL (CONFORMITY
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	AREA		
VOC	0.025		
NOx	11.505		
СО	2.441		
SOx	1.346		
PM 10	1.835		
PM 2.5	1.647		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	0.007		
NOx	2.465		
СО	0.534		
SOx	0.289	100	No
PM 10	0.391		
PM 2.5	0.351		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	0.007		
NOx	2.465		
СО	0.534		
SOx	0.289		
PM 10	0.391	100	No
PM 2.5	0.351		
Pb	0.000		
NH3	0.000		
Nogales, AZ			
VOC	0.008	100	No
NOx	0.090	100	No
CO	0.084		

SOx	0.015	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000		
NH3	0.000	100	No
Douglas (Cochise County),	AZ		
VOC	0.063		
NOx	25.900		
СО	5.546		
SOx	3.032	100	No
PM 10	4.124		
PM 2.5	3.701		
Pb	0.000		
NH3	0.000		
Paul Spur/Douglas (Cochise	County), AZ		
VOC	0.063		
NOx	25.900		
CO	5.546		
SOx	3.032		
PM 10	4.124	100	No
PM 2.5	3.701		
Pb	0.000		
NH3	0.000		

2029 - (Steady State)

Pollutant	Action Emissions (ton/yr) GENERAL CONFORMITY		CONFORMITY
	· · · ·	Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	AREA	· · · · · · · · · · · · · · · · · · ·	
VOC	0.025		
NOx	11.505		
СО	2.441		
SOx	1.346		
PM 10	1.835		
PM 2.5	1.647		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	0.007		
NOx	2.465		
СО	0.534		
SOx	0.289	100	No
PM 10	0.391		
PM 2.5	0.351		
Pb	0.000		
NH3	0.000		
Ajo (Pima County), AZ			
VOC	0.007		
NOx	2.465		
СО	0.534		
SOx	0.289		
PM 10	0.391	100	No
PM 2.5	0.351		
Pb	0.000		
NH3	0.000		

Nogales, AZ			
VOC	0.008	100	No
NOx	0.090	100	No
СО	0.084		
SOx	0.015	100	No
PM 10	0.004	100	No
PM 2.5	0.004	100	No
Pb	0.000		
NH3	0.000	100	No
Douglas (Cochise County),	AZ		
VOC	0.063		
NOx	25.900		
СО	5.546		
SOx	3.032	100	No
PM 10	4.124		
PM 2.5	3.701		
Pb	0.000		
NH3	0.000		
Paul Spur/Douglas (Cochise			
VOC	0.063		
NOx	25.900		
CO	5.546		
SOx	3.032		
PM 10	4.124	100	No
PM 2.5	3.701		
Pb	0.000		
NH3	0.000		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Chris Crabtree, Air Quality Meteorologist	Jun 21 2024
Name, Title	Date

1. General Information

- Action Location

Base: DAVIS-MONTHAN AFB
State: Arizona
County(s): Cochise; Pima; Graham; Santa Cruz
Regulatory Area(s): NOT IN A REGULATORY AREA; Ajo (Pima County), AZ; Nogales, AZ; Douglas (Cochise
County), AZ; Paul Spur/Douglas (Cochise County), AZ

- Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2027

- Action Purpose and Need:

The purpose of the Proposed Action is to co-locate Air Force Special Operations Command (AFSOC) and Air Force Command units that have the resources required to optimize the DAF special operations and special warfare forces to support the National Defense Strategy (NDS), while maximizing AFSOC's capabilities that provide United States Special Operations Command and combatant commands specialized airpower against the entire range of threats to the United States and our allies/partners. The need for the 492 SOW beddown stems from 2023 AFSOC strategic guidance, which aligns with the 2022 NDS - the strategic guidance emphasizes the AFSOC mission to enable the joint force by delivering AFSOC mission capabilities across the spectrum of competition and conflict.

- Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

 Point of Contact 	
Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

Report generated with ACAM version: 5.0.23a

- Activity List:

	Activity Type	Activity Title
2.	Aircraft	AFSOC Mission MC-130J Aircraft Operations - Tombstones A and B
		MOAs - Proposed Action Alternative
3.	Aircraft	AFSOC Mission MC-130J Aircraft Operations - R-2301E (BMGR) -
		Proposed Action Alternative
4.	Aircraft	AFSOC Mission MC-130J Aircraft Operations - R-2303A (Fort Huachuca) -
		Proposed Action Alternative
5.	Aircraft	AFSOC Mission OA-1K Aircraft Operations - Jackal Low MOA - Proposed
		Action Alternative
6.	Aircraft	AFSOC Mission OA-1K Aircraft Operations - Tombstone A and B MOAs -
		Proposed Action Alternative
7.	Aircraft	AFSOC Mission OA-1K Aircraft Operations - R-2301E (BMGR) - Proposed
		Action Alternative
8.	Aircraft	AFSOC Mission OA-1K Aircraft Operations - R-2303A (Fort Huachuca) -
		Proposed Action Alternative

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: Cochise

Regulatory Area(s): NOT IN A REGULATORY AREA; Douglas (Cochise County), AZ; Paul Spur/Douglas (Cochise County), AZ

- Activity Title: AFSOC Mission MC-130J Aircraft Operations - Tombstones A and B MOAs - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2027, the AFSOC mission would fly 451 annual MC-130J sorties within the Tombstones A and B MOAs.

- Activity Start Date

Start Month:1Start Year:2027

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.025141
SO _x	1.345019
NO _x	11.501799
СО	2.438633

Pollutant	Emissions Per Year (TONs)
PM 10	1.835260
PM 2.5	1.646706
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.169322	CO ₂	4026.811214
N ₂ O	0.033035	CO ₂ e	4040.889918

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)		
VOC	0.025141		
SO _x	1.345019		
NO _x	11.501799		
СО	2.438633		

Pollutant	Emissions Per Year (TONs)
PM 10	1.835260
PM 2.5	1.646706
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.169322	CO_2	4026.811214
N ₂ O	0.033035	CO ₂ e	4040.889918

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

 Aircraft Designation: MC-130J
 Engine Model: AE2100D3
 Primary Function: Transport Bomber
 Aircraft has After burn: No
 Number of Engines: 4
- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	724.00	0.13	0.03	3203.44	3214.64
Approach	880.00	0.13	0.03	3203.44	3214.64
Intermediate	1742.00	0.13	0.03	3203.44	3214.64
Military	2262.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft:		14
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	14
Number of Annual Flight Operation Cycle		451
Number of Annual Trim Test(s) per Aircra	aft:	0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	48	
Takeoff [Military] (mins):	0	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Pima

Regulatory Area(s): Ajo (Pima County), AZ; Ajo (Pima County), AZ

- Activity Title: AFSOC Mission MC-130J Aircraft Operations - R-2301E (BMGR) - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2027, the AFSOC mission would fly 96 annual MC-130J sorties within R-2301E (BMGR).

- Activity Start Date Start Month: 1 Start Year: 2027
- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.005351
SO _x	0.286301
NO _x	2.448276
СО	0.519088

Pollutant	Emissions Per Year (TONs)
PM 10	0.390654
PM 2.5	0.350518
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.036042	CO ₂	857.148285
N ₂ O	0.007032	CO ₂ e	860.145082

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.005351
SO _x	0.286301
NO _x	2.448276
СО	0.519088

Pollutant	Emissions Per Year (TONs)
PM 10	0.390654
PM 2.5	0.350518
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.036042	CO_2	857.148285
N ₂ O	0.007032	CO ₂ e	860.145082

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

 Aircraft Designation: MC-130J
 Engine Model: AE2100D3
 Primary Function: Transport Bomber
 Aircraft has After burn: No
 Number of Engines: 4
- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	724.00	0.13	0.03	3203.44	3214.64
Approach	880.00	0.13	0.03	3203.44	3214.64
Intermediate	1742.00	0.13	0.03	3203.44	3214.64
Military	2262.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations		
Number of Aircraft:		14
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles	for all Aircraft:	96
Number of Annual Trim Test(s) per Aircra	ft:	0
 Default Settings Used: No Flight Operations TIMs (Time In Mode) 		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	48	
Takeoff [Military] (mins):	0	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

4. Aircraft

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Cochise

Regulatory Area(s): Douglas (Cochise County), AZ; Paul Spur/Douglas (Cochise County), AZ

- Activity Title: AFSOC Mission MC-130J Aircraft Operations - R-2303A (Fort Huachuca) - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2027, the AFSOC mission would fly 1,053 annual MC-130J sorties within R-2301A (Fort Huachuca).

- Activity Start Date

Start Month:1Start Year:2027

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.031306
SO _x	1.674862

Pollutant	Emissions Per Year (TONs)
PM 10	2.285326
PM 2.5	2.050532

NO _x	14.322417
СО	3.036666

Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.210845
N ₂ O	0.041136

Pollutant	Emissions Per Year (TONs)
CO ₂	5014.317467
CO ₂ e	5031.848732

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.031306
SO _x	1.674862
NO _x	14.322417
СО	3.036666

Pollutant	Emissions Per Year (TONs)
PM 10	2.285326
PM 2.5	2.050532
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.210845	CO_2	5014.317467
N ₂ O	0.041136	CO ₂ e	5031.848732

4.2 Aircraft & Engines

4.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	MC-130J
Engine Model:	AE2100D3
Primary Function:	Transport - Bomber
Aircraft has After burn:	No
Number of Engines:	4

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

4.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e	
Idle	724.00	0.13	0.03	3203.44	3214.64	
Approach	880.00	0.13	0.03	3203.44	3214.64	
Intermediate	1742.00	0.13	0.03	3203.44	3214.64	
Military	2262.00	0.13	0.03	3203.44	3214.64	
After Burn	0.00	0.13	0.03	3203.44	3214.64	

4.3 Flight Operations

4.3.1 Flight Operations Assumptions

- Flight Operations				
Number of Aircraft:		14		
Flight Operation Cycle Type:	LFP (Low Flight Pattern)			
Number of Annual Flight Operation Cycles for all Aircraft:				
Number of Annual Trim Test(s) per Aircraft:	Number of Annual Trim Test(s) per Aircraft:			
- Default Settings Used: No				
- Flight Operations TIMs (Time In Mode)				
Taxi [Idle] (mins):	0			
Approach [Approach] (mins):	0			
Climb Out [Intermediate] (mins):	25.6			
Takeoff [Military] (mins):	0			
Takeoff [After Burn] (mins):	0			

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):

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

4.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

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

- Activity Title: AFSOC Mission OA-1K Aircraft Operations - Jackal Low MOA - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2028, the AFSOC mission would fly 11 annual OA-1K sorties within the Jackal Low MOA.

- Activity Start Date

Start Month:	1
Start Year:	2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000277
SO _x	0.000486
NO _x	0.002991

Pollutant	Emissions Per Year (TONs)
PM 10	0.000145
PM 2.5	0.000132
Pb	0.000000

СО	0.002777
----	----------

NH₃ 0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.000061
N ₂ O	0.000012

Pollutant Emissions Per Year (TO			
CO ₂	1.453843		
CO ₂ e	1.458926		

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.000277
SO _x	0.000486
NO _x	0.002991
СО	0.002777

Pollutant	Emissions Per Year (TONs)
PM 10	0.000145
PM 2.5	0.000132
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Pollutant Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)
CH_4	0.000061		CO_2	1.453843
N ₂ O	0.000012		CO ₂ e	1.458926

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

A
-67B
al - Turboprop

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

The chart of Linghie Greeniouse Gusses I on a durit Linission I actors (15, 100015 fuel)					
	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	142.87	0.13	0.03	3203.44	3214.64
Approach	364.17	0.13	0.03	3203.44	3214.64
Intermediate	618.87	0.13	0.03	3203.44	3214.64
Military	681.14	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft:		15
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	15
Number of Annual Flight Operation Cycle	s for all Aircraft:	11
Number of Annual Trim Test(s) per Aircr	aft:	0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	8	
Takeoff [Military] (mins):	0	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

6. Aircraft

6.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Cochise Regulatory Area(s): Douglas (Cochise County), AZ; Paul Spur/Douglas (Cochise County), AZ

- Activity Title: AFSOC Mission OA-1K Aircraft Operations - Tombstone A and B MOAs - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2028, the AFSOC mission would fly 300 annual OA-1K sorties within the Tombstone A and B MOAs.

- Activity Start Date

Start Month:	1
Start Year:	2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.007050
SO _x	0.012366
NO _x	0.076163

Pollutant	Emissions Per Year (TONs)
PM 10	0.003698
PM 2.5	0.003352
Pb	0.000000

NH₃ 0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.001557
N ₂ O	0.000304

Pollutant	Emissions Per Year (TONs)
CO ₂	37.023429
CO ₂ e	37.152871

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.007050
SO _x	0.012366
NO _x	0.076163
СО	0.070731

Pollutant	Emissions Per Year (TONs)
PM 10	0.003698
PM 2.5	0.003352
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	0.001557	CO_2	37.023429
N ₂ O	0.000304	CO ₂ e	37.152871

6.2 Aircraft & Engines

6.2.1 Aircraft & Engines Assumptions

- Aircraft	&	Engine	

Aircraft Designation:	U-28A
Engine Model:	PT6A-67B
Primary Function:	General - Turboprop
Aircraft has After burn:	No
Number of Engines:	1

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

6.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	142.87	0.13	0.03	3203.44	3214.64
Approach	364.17	0.13	0.03	3203.44	3214.64
Intermediate	618.87	0.13	0.03	3203.44	3214.64
Military	681.14	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

6.3 Flight Operations

6.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: Flight Operation Cycle Type:	LFP (Low Flight Pattern)	15
Number of Annual Flight Operation Cycles for all Aircraft:		300
Number of Annual Trim Test(s) per Aircra	aft:	0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	7.47	
Takeoff [Military] (mins):	0	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

6.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Pima

Regulatory Area(s): Ajo (Pima County), AZ; Ajo (Pima County), AZ

- Activity Title: AFSOC Mission OA-1K Aircraft Operations - R-2301E (BMGR) - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2028, the AFSOC mission would fly 60 annual OA-1K sorties within R-2301E (BMGR).

- Activity Start Date Start Month: 1 Start Year: 2028
- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.001510
SO _x	0.002649
NO _x	0.016313
СО	0.015150

Pollutant	Emissions Per Year (TONs)
PM 10	0.000792
PM 2.5	0.000718
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.000333	CO_2	7.930052
N ₂ O	0.000065	CO ₂ e	7.957777

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.001510
SO _x	0.002649
NO _x	0.016313
СО	0.015150

Pollutant	Emissions Per Year (TONs)
PM 10	0.000792
PM 2.5	0.000718
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.000333	CO_2	7.930052
N ₂ O	0.000065	CO ₂ e	7.957777

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

 Aircraft Designation:
 U-28A
 Engine Model:
 PT6A-67B
 Primary Function:
 General Turboprop
 - Aircraft has After burn: No Number of Engines: 1
- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e	
Idle	142.87	0.13	0.03	3203.44	3214.64	
Approach	364.17	0.13	0.03	3203.44	3214.64	
Intermediate	618.87	0.13	0.03	3203.44	3214.64	
Military	681.14	0.13	0.03	3203.44	3214.64	
After Burn	0.00	0.13	0.03	3203.44	3214.64	

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

- Flight Operations		
Number of Aircraft:	LED (Lease Elistet Detterm)	15
Flight Operation Cycle Type: Number of Annual Flight Operation Cycles	LFP (Low Flight Pattern)	60
Number of Annual Trim Test(s) per Aircraft:		
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	8	
Takeoff [Military] (mins):	0	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Santa Cruz Regulatory Area(s): Nogales, AZ

- Activity Title: AFSOC Mission OA-1K Aircraft Operations - R-2303A (Fort Huachuca) - Proposed Action Alternative

- Activity Description:

Beginning in calendar year 2028, the AFSOC mission would fly 900 annual OA-1K sorties within R-2303A (Fort Huachuca).

- Activity Start Date

Start Month:1Start Year:2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.008324
SO _x	0.014601

Pollutant	Emissions Per Year (TONs)
PM 10	0.004367
PM 2.5	0.003957

NO _x	0.089928
СО	0.083514

Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.001838
N ₂ O	0.000359

Pollutant	Emissions Per Year (TONs)
CO ₂	43.714410
CO ₂ e	43.867246

- Activity Emissions of Criteria Pollutants [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.008324
SO _x	0.014601
NO _x	0.089928
СО	0.083514

Pollutant	Emissions Per Year (TONs)
PM 10	0.004367
PM 2.5	0.003957
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.001838	CO_2	43.714410
N ₂ O	0.000359	CO ₂ e	43.867246

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	U-28A
Engine Model:	PT6A-67B
Primary Function:	General - Turboprop
Aircraft has After burn:	No
Number of Engines:	1

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	142.87	0.13	0.03	3203.44	3214.64
Approach	364.17	0.13	0.03	3203.44	3214.64
Intermediate	618.87	0.13	0.03	3203.44	3214.64
Military	681.14	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations			
Number of Aircraft:		15	
Flight Operation Cycle Type:	LFP (Low Flight Pattern)		
Number of Annual Flight Operation Cycles for all Aircraft:			
Number of Annual Trim Test(s) per Aircraft:			
- Default Settings Used: No - Flight Operations TIMs (Time In Mode)			
Taxi [Idle] (mins):	0		
Approach [Approach] (mins):	0		
Climb Out [Intermediate] (mins):	2.94		
Takeoff [Military] (mins):	0		
Takeoff [After Burn] (mins):	0		

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):

	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

0

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

ATTACHMENT 1-E

Total Greenhouse Gas (GHG) Emissions for (1) A-10 Operations – No Action Alternative and (2) Total GHG Emissions for the 492 SOW Beddown Proposed Action - Summary and Detail Reports

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

Report generated with ACAM version: 5.0.23a

a. Action Location: Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

f. Point of Contact:

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

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

applicableXnot applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (hsba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (hsba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators.*

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2026				
Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR		
		Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	-212.111	250	No	
NOx	-305.174	250	No	
СО	-428.679	250	No	
SOx	-18.068	250	No	
PM 10	-60.991	250	No	
PM 2.5	-57.384	250	No	
Pb	0.000	25	No	
NH3	-0.254	250	No	

2026

2027 - (Steady State)

2027 (Steady State)					
Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR			
		Indicator (ton/yr)	Exceedance (Yes or No)		
NOT IN A REGULATORY	AREA				
VOC	-212.111	250	No		
NOx	-305.174	250	No		
СО	-428.679	250	No		
SOx	-18.068	250	No		
PM 10	-60.991	250	No		
PM 2.5	-57.384	250	No		
Pb	0.000	25	No		
NH3	-0.254	250	No		

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Chris Crabtree, Air Quality Meteorologist

Name, Title

Aug 02 2024

Date

1. General Information

Action Location Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2026

- Action Purpose and Need:

The purpose of the Proposed Action is to co-locate Air Force Special Operations Command (AFSOC) and Air Force Command units that have the resources required to optimize the DAF special operations and special warfare forces to support the National Defense Strategy (NDS), while maximizing AFSOC's capabilities that provide United States Special Operations Command and combatant commands specialized airpower against the entire range of threats to the United States and our allies/partners. The need for the 492 SOW beddown stems from 2023 AFSOC strategic guidance, which aligns with the 2022 NDS - the strategic guidance emphasizes the AFSOC mission to enable the joint force by delivering AFSOC mission capabilities across the spectrum of competition and conflict.

- Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

- Point of Contact

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

Report generated with ACAM version: 5.0.23a

- Activity List:

11001		
	Activity Type	Activity Title
2.	Aircraft	Retirement of A-10s - LTOs - No Action Alternative
3.	Aircraft	Retirement of A-10s - Closed Patterns
4.	Personnel	Commuting Activities - Removal of 357 FS and 47 FS Personnel
5.	Aircraft	GHG Emissions from A-10 Operations Beyond Davis-Monthan AFB

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? Remove

- Activity Location

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

- Activity Title: Retirement of A-10s - LTOs - No Action Alternative

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations include 10,320 landing and take-offs (closed patterns calculoated with a seperate ACAM module).

- Activity Start Date

Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)		
VOC	-210.018499		
SO _x	-17.961316		
NO _x	-303.638691		
СО	-405.700001		

Pollutant	Emissions Per Year (TONs)
PM 10	-60.480822
PM 2.5	-56.925929
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	-0.940004
N ₂ O	-0.185538

Pollutant	Emissions Per Year (TONs)		
CO ₂	-22737.218390		
CO ₂ e	-22816.029422		

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

Pollutant	Emissions Per Year (TONs)			
VOC	-75.586269			
SO _x	-3.972229			
NO _x	-18.330560			
СО	-218.056426			

tions (includes 11in 1est & 11 e) partj.			
Pollutant Emissions Per Year (TONs)			
PM 10	-23.973829		
PM 2.5	-21.580002		
Pb	0.000000		
NH ₃	0.000000		

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:					
Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)	
CH ₄	-0.500055		CO ₂	-11892.335332	
N ₂ O	-0.097561		CO ₂ e	-11933.913809	

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	-0.181118
SO _x	-0.037767
NO _x	-0.272077
СО	-0.692646

Pollutant	Emissions Per Year (TONs)
PM 10	-0.168415
PM 2.5	-0.151532
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.004754	CO ₂	-113.068618
N ₂ O	-0.000928	CO ₂ e	-113.463933

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

Pollutant	Emissions Per Year (TONs)	P	Pollutant	Emissions Per Year (TONs)
VOC	-134.251112	PM	10	-36.338578
SO _x	-13.951320	PM	2.5	-35.194395
NO _x	-285.036055	Pb		0.000000
СО	-186.950929	NH ₃		0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.435194	CO_2	-10731.814440
N ₂ O	-0.087049	CO ₂ e	-10768.651680

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e		
Idle	390.00	0.13	0.03	3203.44	3214.64		
Approach	920.00	0.13	0.03	3203.44	3214.64		
Intermediate	460.00	0.13	0.03	3203.44	3214.64		
Military	2710.00	0.13	0.03	3203.44	3214.64		
After Burn	0.00	0.13	0.03	3203.44	3214.64		

- Aircraft & Engine	Creenhouse	Cassas	Pollutant	Fmission	Factors	(Ib/10001b f	(lou
- Aircrait & Engine	Greennouse	Gasses	Ponutant	LIIIISSIOII	r actors	(10/100010 1	uer)

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

 Flight Operations Number of Aircraft: Flight Operation Cycle Type: Number of Annual Flight Operation Cycles I Number of Annual Trim Test(s) per Aircraft 		32 10320 12
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	26.33	
Approach [Approach] (mins):	5.46	
Climb Out [Intermediate] (mins):	0.96	
Takeoff [Military] (mins):	1.25	
Takeoff [After Burn] (mins):	0	

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
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: 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

Number of APU	Operation Hours	Exempt	Designation	Manufacturer
per Aircraft	for Each LTO	Source?		

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)								
Designation	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5	
- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)								
Designation	Fuel Flow	CH ₄		N ₂ O	CO ₂		CO ₂ e	

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_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

2.5 Aircraft Engine Test Cell

2.5.1 Aircraft Engine Test Cell Assumptions

Engine Test Cell
 Total Number of Aircraft Engines Tested Annually: 64

- Default Settings Used: Yes

- Annual Run-ups / Test Durations	
Annual Run-ups (Per Aircraft Engine):	1 (default)
Idle Duration (mins):	12 (default)
Approach Duration (mins):	27 (default)
Intermediate Duration (mins):	9 (default)
Military Duration (mins):	12 (default)
After Burner Duration (mins):	0 (default)

2.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

2.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000

TestCellPS_{POL}: Aircraft Engine Test Cell 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: Total Number of Engines (For All Aircraft) ARU: Annual Run-ups (Per Aircraft Engine) 2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

 $TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs)

TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) TestCellPS_{INTERMEDIATE}: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

2.6 Aerospace Ground Equipment (AGE)

2.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes
- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 10320

- Aerospace Ground Equipment (AGE) (default)

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

2.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
MJ-1B	0.0	3.040	0.219	4.780	3.040	0.800	0.776
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205

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

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

The opport of our Light from (102) of comouse outpots Limbsion 1 woods (18,111)						
Designation	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e	
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6	
MJ-1B	0.0	0.0	0.0	151.7	152.2	
A/M32A-86D	6.5	0.0	0.0	145.6	146.1	
H1	0.4	0.0	0.0	8.8	8.8	
MJ-2A	0.0	0.0	0.0	184.7	185.3	
NF-2	0.0	0.0	0.0	23.7	23.8	
A/M32A-60A	0.0	0.0	0.0	237.4	238.2	

2.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

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

AGE_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr) 2000: Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location County: Pima

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Retirement of A-10s - Closed Patterns

- Activity Description:

In FY26, the 357 FS and 47 FS would inactivate the remainder of their A-10Cs at DM. Current annual A-10C operations include 1,714 closed patterns.

- Activity Start Date	
Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite: Yes End Month: N/A End Year: N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-0.394563
SO _x	-0.099940
NO _x	-0.679080
СО	-1.776844

Pollutant	Emissions Per Year (TONs)
PM 10	-0.482420
PM 2.5	-0.434111
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.012581	CO_2	-299.206336
N ₂ O	-0.002455	CO ₂ e	-300.252434

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	 Pollutant	Emissions Per Year (7
VOC	-0.394563	PM 10	-0.482420
SO _x	-0.099940	PM 2.5	-0.434111
NO _x	-0.679080	Pb	0.000000
СО	-1.776844	NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	-0.012581	CO ₂	-299.206336
N ₂ O	-0.002455	CO ₂ e	-300.252434

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

TONs)

Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

- All chart & Engine Of combuse Oasses Fondant Emission Factors (10/100010 fuct)							
	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e		
Idle	390.00	0.13	0.03	3203.44	3214.64		
Approach	920.00	0.13	0.03	3203.44	3214.64		
Intermediate	460.00	0.13	0.03	3203.44	3214.64		
Military	2710.00	0.13	0.03	3203.44	3214.64		
After Burn	0.00	0.13	0.03	3203.44	3214.64		

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

Number of Aircraft: 32	
Flight Operation Cycle Type: CP (Close Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft: 171	.4
Number of Annual Trim Test(s) per Aircraft: 0	
- Default Settings Used: No	

- Flight Operations TIMs (Time In Mode)	
Taxi [Idle] (mins):	0
Approach [Approach] (mins):	1.66
Climb Out [Intermediate] (mins):	0.96
Takeoff [Military] (mins):	0.48
Takeoff [After Burn] (mins):	0

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): 0 Approach (mins): 0

Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

4. Personnel

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove
- Activity Location County: Pima **Regulatory Area(s):** NOT IN A REGULATORY AREA
- Activity Title: Commuting Activities - Removal of 357 FS and 47 FS Personnel

- Activity Description:

In FY26, retirement of the 357 FS and 47 FS would remove 969/14 military/civilian personnel at DM.

- Activity Start Date

Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	-1.698271
SO _x	-0.007142
NO _x	-0.855950
CO	-21.202157

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	-0.081841
N ₂ O	-0.034197

Pollutant	Emissions Per Year (TONs)
PM 10	-0.027440
PM 2.5	-0.024287
Pb	0.000000
NH ₃	-0.254462

Pollutant	Emissions Per Year (TONs)
CO ₂	-2129.716318
CO ₂ e	-2141.949113

4.2 Personnel Assumptions

- Number of Personnel	
Active Duty Personnel:	969
Civilian Personnel:	14
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)

ays Per Week (default)
ays Per Week (default)
ays Per Week (default)
ays Per Week (default)
ays Per Month (default)

4.3 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

4.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year $VMT_P = NP * WD * AC$

VMT_P: 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_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5. Aircraft

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

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

- Activity Title: GHG Emissions from A-10 Operations Beyond Davis-Monthan AFB

- Activity Description:

Beginning in calendar year 2026, there would be 10,320 annual A-10 sorties eliminated between Davis-Monthan AFB and regional airspaces and training areas and within these areas. Each sortie would last for 1.3 hours.

-	Activity	Start	Date
---	----------	-------	------

Start Month:	1
Start Year:	2026

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)		
VOC	0.000000		
SO _x	0.000000		
NO _x	0.000000		
СО	0.000000		

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	-3.352236
N ₂ O	-0.654022

Pollutant	Emissions Per Year (TONs)		
CO_2	-79722.986179		
CO ₂ e	-80001.716995		

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SO _x	0.000000	PM 2.5	0.000000
NO _x	0.000000	Pb	0.000000
СО	0.000000	NH ₃	0.000000

Pollutant Emissions Per Year (TONs)		- -	Pollutant	Emissions Per Year (TONs)
CH_4	-3.352236		CO_2	-79722.986179
N ₂ O	-0.654022		CO ₂ e	-80001.716995

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

5.2 Aircraft & Engines

5.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	A-10C
Engine Model:	TF34-GE-100
Primary Function:	Combat
Aircraft has After burn:	No
Number of Engines:	2

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

5.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	390.00	39.45	1.07	2.10	106.70	8.13	7.32
Approach	920.00	2.19	1.07	5.70	16.30	6.21	5.59
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	8.04
Military	2710.00	0.12	1.07	10.70	2.20	2.66	2.39
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
Idle	390.00	0.13	0.03	3203.44	3214.64
Approach	920.00	0.13	0.03	3203.44	3214.64
Intermediate	460.00	0.13	0.03	3203.44	3214.64
Military	2710.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

5.3 Flight Operations

5.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft:		32
Flight Operation Cycle Type:	DC (Destination Cycle)	
Number of Annual Flight Operation Cycles for a	ll Aircraft:	10320
Number of Annual Trim Test(s) per Aircraft:		0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	

Climb Out [Intermediate] (mins):	29.64
Takeoff [Military] (mins):	48.36
Takeoff [After Burn] (mins):	0

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

5.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

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

Report generated with ACAM version: 5.0.23a

a. Action Location: Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

c. Project Number/s (if applicable):

d. Projected Action Start Date: 9 / 2025

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

f. Point of Contact:

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

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

applicableXnot applicable

Total reasonably foreseeable net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (hsba.e., no net gain/loss in emission stabilized and the action is fully implemented) emissions. The ACAM analysis uses the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of the proposed Action's potential impacts to local air quality. The insignificance indicators are trivial (de minimis) rate thresholds that have been demonstrated to have little to no impact to air quality. These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold and 25 ton/yr for lead for actions occurring in areas that are "Attainment" (hsba.e., not exceeding any National Ambient Air Quality Standard (NAAQS)). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQS. For further detail on insignificance indicators, refer to *Level II, Air Quality Quantitative Assessment, Insignificance Indicators*.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicators and are summarized below.

Analysis Summary:

2025				
Pollutant	Action Emissions (ton/yr) INSIGNIFICANCE INDICATOR		ICE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	0.012	250	No	
NOx	0.103	250	No	
СО	0.146	250	No	
SOx	0.000	250	No	
PM 10	0.071	250	No	
PM 2.5	0.003	250	No	
Pb	0.000	25	No	
NH3	0.000	250	No	

2026				
Pollutant	Action Emissions (ton/yr) INSIGNIFICANCE INDICATOR		NCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	1.265	250	No	
NOx	4.546	250	No	
СО	5.789	250	No	
SOx	0.010	250	No	
PM 10	8.248	250	No	
PM 2.5	0.143	250	No	
Pb	0.000	25	No	
NH3	0.022	250	No	

2027				
Pollutant	Action Emissions INSIGNIFICANCE INDICATOR		ICE INDICATOR	
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	7.496	250	No	
NOx	100.726	250	No	
СО	70.573	250	No	
SOx	5.134	250	No	
PM 10	9.805	250	No	
PM 2.5	8.904	250	No	
Pb	0.000	25	No	
NH3	0.575	250	No	

2028

Pollutant	Action Emissions	INSIGNIFICANCE INDICATOR		
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)	
NOT IN A REGULATORY	AREA			
VOC	22.912	250	No	
NOx	234.858	250	No	
СО	114.108	250	No	
SOx	8.186	250	No	
PM 10	13.346	250	No	
PM 2.5	12.292	250	No	
Pb	0.000	25	No	
NH3	0.575	250	No	

2029 - (Steady State)

Pollutant	Action Emissions	INSIGNIFICAN	CE INDICATOR
	(ton/yr)	Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY	Y AREA		
VOC	22.912	250	No
NOx	234.858	250	No
СО	114.108	250	No
SOx	8.186	250	No
PM 10	13.346	250	No
PM 2.5	12.292	250	No
Pb	0.000	25	No
NH3	0.575	250	No

None of the estimated annual net emissions associated with this action are above the insignificance indicators; therefore, the action will not cause or contribute to an exceedance of one or more NAAQSs and will have an insignificant impact on air quality. No further air assessment is needed.

Chris Crabtree, Air Quality Meteorologist	Aug 16 2024
Name, Title	Date

1. General Information

Action Location Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

- Project Number/s (if applicable):

- Projected Action Start Date: 9 / 2025

- Action Purpose and Need:

The purpose of the Proposed Action is to co-locate Air Force Special Operations Command (AFSOC) and Air Force Command units that have the resources required to optimize the DAF special operations and special warfare forces to support the National Defense Strategy (NDS), while maximizing AFSOC's capabilities that provide United States Special Operations Command and combatant commands specialized airpower against the entire range of threats to the United States and our allies/partners. The need for the 492 SOW beddown stems from 2023 AFSOC strategic guidance, which aligns with the 2022 NDS - the strategic guidance emphasizes the AFSOC mission to enable the joint force by delivering AFSOC mission capabilities across the spectrum of competition and conflict.

- Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

- Point of Contact

Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

Report generated with ACAM version: 5.0.23a

- Activ	• Activity List:					
	Activity Type	Activity Title				
2.	Construction / Demolition	Demolish Buildings 4809 and 4826				
3.	Construction / Demolition	Renovate Existing Buildings/Infrastructure				
4.	Construction / Demolition	Construct Installation Communications Center and STS Squadron				
		Operations Complex				
5.	Construction / Demolition	Construct 2-Bay MC-130J Hangar and Maintenance				
6.	Construction / Demolition	Construct Parking Area for the STS Squadron Operations Complex				
7.	Aircraft	MC-130J - LTOs - Proposed Action Alternative				
8.	Aircraft	MC-130Js - Closed Patterns - Proposed Action Alternative				
9.	Aircraft	OA-1K - LTOs - Proposed Action Alternative				
10.	Aircraft	OA-1K - Closed Patterns - Proposed Action Alternative				
11.	Personnel	Commuting Activities - AFSOC Personnel - Proposed Action Alternative				
12.	Aircraft	GHGs Emissions for MC-130J Aircraft Operations Beyond Davis-Monthan				
		AFB				
13.	Aircraft	GHGs Emissions for OA-1K Aircraft Operations other than LTOs - AFSOC				
		Mission - Proposed Action				

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

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location County: Pima Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: Demolish Buildings 4809 and 4826

- Activity Description:

Buildings 4809/4826 are 13,800/2,243 square feet (SF) and 20 feet high. Assumed this is the first proposed construction activity that will occur before the end of CY2025.

- Activity Start Date Start Month: 9

Start Month: 2025

- Activity End Date

Indefinite:	False
End Month:	10
End Month:	2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.011846
SO _x	0.000210
NO _x	0.103302
СО	0.146129

Pollutant	Total Emissions (TONs)
PM 10	0.070954
PM 2.5	0.003287
Pb	0.000000
NH ₃	0.000443

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.000886
N ₂ O	0.000711

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.000886
N ₂ O	0.000711

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date	
--------------------	--

Start Month:	9
Start Quarter:	1
Start Year:	2025

- Phase Duration

Number of Month: 2 Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
 Area of Building to be demolished (ft²): 16043
 Height of Building to be demolished (ft): 20
- Default Settings Used: Yes
- Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20 (default)Average Hauling Truck Round Trip Commute (mile):20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

Pollutant	Total Emissions (TONs)
CO_2	24.445210
CO ₂ e	24.679308

Pollutant	Total Emissions (TONs)
CO ₂	24.445210
CO ₂ e	24.679308

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.43930	0.00743	3.63468	4.34820	0.10060	0.09255
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.37086	0.00491	3.50629	2.90209	0.15396	0.14165
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.19600	0.00489	2.00960	3.48168	0.07738	0.07119

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]					
	CH4	N ₂ O	CO ₂	CO ₂ e	
Emission Factors	0.02333	0.00467	575.01338	576.98668	
Rubber Tired Dozen	Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH4	N ₂ O	CO ₂	CO ₂ e	
Emission Factors	0.02159	0.00432	532.17175	533.99803	
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]					
	CH4	N ₂ O	CO ₂	CO ₂ e	
Emission Factors	0.02149	0.00430	529.86270	531.68105	

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.30142	0.00112	0.14251	4.08808	0.00416	0.00368	0.05175
LDGT	0.25342	0.00139	0.19236	3.68952	0.00487	0.00431	0.04344
HDGV	0.89996	0.00309	0.67317	10.90787	0.02123	0.01878	0.09292
LDDV	0.09356	0.00129	0.16316	6.10700	0.00348	0.00320	0.01646
LDDT	0.20346	0.00147	0.52838	5.86403	0.00574	0.00528	0.01748
HDDV	0.11675	0.00430	2.63726	1.56466	0.05095	0.04688	0.06590
MC	3.36641	0.00129	0.73953	12.64256	0.02294	0.02029	0.05323

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01412	0.00504	334.09665	335.94916
LDGT	0.01438	0.00725	415.07038	417.58861
HDGV	0.05477	0.02655	921.28340	930.55521
LDDV	0.04541	0.00068	381.81680	383.15416
LDDT	0.03408	0.00100	434.38854	435.53875
HDDV	0.02100	0.16245	1278.56719	1327.50121
MC	0.11928	0.00310	394.04060	397.94562

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

PM10_{FD} = (0.00042 * BA * BH) / 2000

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft³)
BA: Area of Building to be demolished (ft²)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (1 / 27) = 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft²)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \mbox{ Vehicle Emissions (TONs)} \\ VMT_{WT}: \mbox{ Worker Trips Vehicle Miles Travel (miles)} \\ 0.002205: \mbox{ Conversion Factor grams to pounds} \\ EF_{POL}: \mbox{ Emission Factor for Pollutant (grams/mile)} \\ VM: \mbox{ Worker Trips On Road Vehicle Mixture (\%)} \\ 2000: \mbox{ Conversion Factor pounds to tons} \end{array}$

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

 Activity Location County: Pima Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Renovate Existing Buildings/Infrastructure

- Activity Description:

The Proposed Action would renovate 28 existing buildings/infrastructure units onbase. Total SF of these structures = 593,534. Applied a factor of 0.10 to this SF, then input this value into the Building Construction module to simulate the effort needed to complete these proposed renovations. Assumed as a worst-case that all renovations would occur on one year = CY 2026.

- Activity Start Date

Start Month:	1
Start Month:	2026

- Activity End Date

Indefinite:	False
End Month:	12
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.274527
SO _x	0.002909
NO _x	1.273751
СО	1.698441

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.011635
N ₂ O	0.005871

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.011635
N ₂ O	0.005871

3.1 Building Construction Phase

3.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date Start Month: 1 Start Quarter: 1 Start Year: 2026

- Phase Duration Number of Month: 12 Number of Days: 0

Pollutant	Total Emissions (TONs)
PM 10	0.043521
PM 2.5	0.040030
Pb	0.000000
NH ₃	0.004030

Pollutant	Total Emissions (TONs)
CO_2	305.990347
CO ₂ e	308.030442

Pollutant	Total Emissions (TONs)
CO ₂	305.990347
CO ₂ e	308.030442

3.1.2 Building Construction Phase Assumptions

- General Building Construction Information					
Building Category: Office or Industr					
Area of Building (ft ²):	59400				
Height of Building (ft):	20				
Number of Units:	N/A				

- Building Construction Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

vehicle Exhibite (70)									
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC		
POVs	0	0	0	0	0	100.00	0		

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

3.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925			
Forklifts Composite	e [HP: 82] [LF:	0.2]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287			
Generator Sets Con	Generator Sets Composite [HP: 14] [LF: 0.74]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019			
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]									

	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839	
Welders Composite [HP: 46] [LF: 0.45]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786	

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]								
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02140	0.00428	527.46069	529.27080				
Forklifts Composite	[HP: 82] [LF: 0.2]							
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02138	0.00428	527.09717	528.90603				
Generator Sets Con	posite [HP: 14] [LF: 0	.74]						
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02305	0.00461	568.32694	570.27730				
Tractors/Loaders/B	ackhoes Composite [H]	P: 84] [LF: 0.37]						
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02149	0.00430	529.70686	531.52468				
Welders Composite	[HP: 46] [LF: 0.45]							
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02305	0.00461	568.29068	570.24091				

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

(grans, mic)							
	VOC	SOx	NOx	CO	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

3.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour)

0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

 $\begin{array}{l} VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ BA: \ Area \ of \ Building \ (ft^2) \\ BH: \ Height \ of \ Building \ (ft) \\ (0.42 \ / \ 1000): \ Conversion \ Factor \ ft^3 \ to \ trips \ (0.42 \ trip \ / \ 1000 \ ft^3) \\ HT: \ Average \ Hauling \ Truck \ Round \ Trip \ Commute \ (mile/trip) \end{array}$

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft²)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft³ to trips (0.38 trip / 1000 ft³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

3.2 Architectural Coatings Phase

3.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date Start Month: 9 Start Quarter: 1 Start Year: 2026
- Phase Duration Number of Month: 1 Number of Days: 0

3.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information Building Category: Non-Residential Total Square Footage (ft²): 10000 Number of Units: N/A
- Architectural Coatings Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Worker Trips Average Worker Round Trip Commute (mile):

- Worker Trips Vehicle Mixture (%)

() of her rips (ender minute (/))							
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

20 (default)

3.2.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

3.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

 $VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft²)
800: Conversion Factor square feet to man days (1 ft² / 1 man * day)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft²)
2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area)
0.0116: Emission Factor (lb/ft²)
2000: Conversion Factor pounds to tons

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

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

- Activity Title: Construct Installation Communications Center and STS Squadron Operations Complex

- Activity Description:

Construction of the Installation Communications Center and STS Squadron Operations Complex would occur on bare soil and therefore would require grading, so the analysis combined all of these projects into one module. The combined gross/building footprints = 354,620/297,480 SF. Assumed as a worst-case that all construction would occur in one year = CY2026. Also includes construction of 98,000 SF of parking in the STS Squadron Operations Complex.

- Activity Start Date

Start Month:1Start Month:2026

- Activity End Date

Indefinite:	False
End Month:	12
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.593838
SO _x	0.003931
NO _x	1.857698
СО	2.311038

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N ₂ O	0.021032

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.016591
N ₂ O	0.021032

4.1 Site Grading Phase

4.1.1 Site Grading Phase Timeline Assumptions

Phase Start Date	
Start Month:	1
Start Quarter:	1
Start Year:	2026

-

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

4.1.2 Site Grading Phase Assumptions

- General Site Grading Information	
Area of Site to be Graded (ft ²):	354620
Amount of Material to be Hauled On-Site (yd ³):	1000
Amount of Material to be Hauled Off-Site (yd ³):	1000
- Site Grading Default Settings	

- Site Grading Default Settings	
Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20 (default)Average Hauling Truck Round Trip Commute (mile):20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

Pollutant	Total Emissions (TONs)
PM 10	7.179421
PM 2.5	0.059089
Pb	0.000000
NH ₃	0.010332

Pollutant	Total Emissions (TONs)
CO ₂	495.177394
CO ₂ e	501.859555

Pollutant	Total Emissions (TONs)
CO ₂	495.177394
CO ₂ e	501.859555

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071			
Graders Composite	Graders Composite [HP: 148] [LF: 0.41]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918			
Other Construction	Other Construction Equipment Composite [HP: 82] [LF: 0.42]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546			
Rubber Tired Dozen	rs Composite [H	IP: 367] [LF: 0	.4]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069			
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5			
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839			

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Compos	Excavators Composite [HP: 36] [LF: 0.38]								
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02381	0.00476	587.02896	589.04350					
Graders Composite	[HP: 148] [LF: 0.41]								
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02153	0.00431	530.81500	532.63663					
Other Construction	Equipment Composite	[HP: 82] [LF: 0.42]							
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02140	0.00428	527.54121	529.35159					
Rubber Tired Dozen	rs Composite [HP: 367]	[LF: 0.4]							
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02160	0.00432	532.54993	534.37751					
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]								
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02149	0.00430	529.70686	531.52468					

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

	VOC	SOx	NO _x	CO	PM 10	PM 2.5	NH ₃			
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985			
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207			
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192			
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658			
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711			
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657			
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361			

- Venice Exhaust & Worker Trips Orcennouse Gasses Emission Factors (grains/mile)								
	CH4	N ₂ O	CO ₂	CO ₂ e				
LDGV	0.01267	0.00485	329.19789	330.95831				
LDGT	0.01235	0.00694	407.55001	409.92671				
HDGV	0.05144	0.02676	924.61645	933.86686				
LDDV	0.04552	0.00068	379.44291	380.78290				
LDDT	0.03328	0.00100	428.74284	429.87432				
HDDV	0.02063	0.16392	1259.79671	1309.16119				
MC	0.11763	0.00308	394.15228	398.01144				

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

4.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

 $\begin{array}{ll} VMT_{VE}: \mbox{ Vehicle Exhaust Vehicle Miles Travel (miles)} \\ HA_{OnSite}: \mbox{ Amount of Material to be Hauled On-Site (yd^3)} \\ HA_{OffSite}: \mbox{ Amount of Material to be Hauled Off-Site (yd^3)} \\ HC: \mbox{ Average Hauling Truck Capacity (yd^3)} \\ (1 / HC): \mbox{ Conversion Factor cubic yards to trips (1 trip / HC yd^3)} \\ HT: \mbox{ Average Hauling Truck Round Trip Commute (mile/trip)} \end{array}$

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Vehicle Exhaust On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \mbox{ Vehicle Emissions (TONs)} \\ VMT_{WT}: \mbox{ Worker Trips Vehicle Miles Travel (miles)} \\ 0.002205: \mbox{ Conversion Factor grams to pounds} \\ EF_{POL}: \mbox{ Emission Factor for Pollutant (grams/mile)} \\ VM: \mbox{ Worker Trips On Road Vehicle Mixture (\%)} \\ 2000: \mbox{ Conversion Factor pounds to tons} \end{array}$

4.2 Trenching/Excavating Phase

4.2.1 Trenching / Excavating Phase Timeline Assumptions

```
- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2026
```

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

4.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information	
Area of Site to be Trenched/Excavated (ft ²):	3000
Amount of Material to be Hauled On-Site (yd ³):	1000
Amount of Material to be Hauled Off-Site (yd ³):	150

- Trenching Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd ³):	20 (default)
Average Hauling Truck Round Trip Commute (mile):	20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Compos	Excavators Composite [HP: 36] [LF: 0.38]										
	VOC	SOx	NO _x	СО	PM 10	PM 2.5					
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071					
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]											
	VOC	SOx	NOx	СО	PM 10	PM 2.5					
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404					
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]										
	VOC	SOx	NOx	СО	PM 10	PM 2.5					
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839					

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Composite [HP: 36] [LF: 0.38]									
	CH ₄	N_2O	CO ₂	CO ₂ e					
Emission Factors	0.02381	0.00476	587.02896	589.04350					
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]									
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02385	0.00477	587.87714	589.89459					
Tractors/Loaders/B	ackhoes Composite [H]	P: 84] [LF: 0.37]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02149	0.00430	529.70686	531.52468					

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

veniere Exhlust & (venier Trips eriteriu i enduant Emission i deteris (gruins/mile)							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

4.3 Building Construction Phase

4.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date Start Month: 3 Start Quarter: 1 Start Year: 2026

Phase Duration
 Number of Month: 10
 Number of Days: 0

4.3.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category:	Office or Industrial
Area of Building (ft ²):	297480
Height of Building (ft):	20
Number of Units:	N/A

Building Construction Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	2	7
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

4.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [HP: 367] [LF: 0.29]										
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925				
Forklifts Composite	[HP: 82] [LF:	0.2]								
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287				
Generator Sets Con	Generator Sets Composite [HP: 14] [LF: 0.74]									
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019				
Tractors/Loaders/B	ackhoes Compo	osite [HP: 84] [LF: 0.37]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5				
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839				
Welders Composite	Welders Composite [HP: 46] [LF: 0.45]									
	VOC	SO _x	NO _x	СО	PM 10	PM 2.5				
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786				

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite []	Cranes Composite [HP: 367] [LF: 0.29]								
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02140	0.00428	527.46069	529.27080					
Forklifts Composite	[HP: 82] [LF: 0.2]								
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02138	0.00428	527.09717	528.90603					
Generator Sets Com	Generator Sets Composite [HP: 14] [LF: 0.74]								
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02305	0.00461	568.32694	570.27730					
Tractors/Loaders/Ba	ackhoes Composite [Hl	P: 84] [LF: 0.37]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02149	0.00430	529.70686	531.52468					
Welders Composite	[HP: 46] [LF: 0.45]								
	CH4	N ₂ O	CO ₂	CO ₂ e					
Emission Factors	0.02305	0.00461	568.29068	570.24091					

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

veniele Exhiuist & Worker Trips Oriteriu Fonduurt Ennission Fuetors (gruins/mile)							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671

HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft²)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft³ to trips (0.42 trip / 1000 ft³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{WT}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) BA: Area of Building (ft²) BH: Height of Building (ft) (0.38 / 1000): Conversion Factor ft³ to trips (0.38 trip / 1000 ft³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

4.4 Architectural Coatings Phase

4.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date Start Month: 10 Start Quarter: 1 Start Year: 2026

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

4.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information Building Category: Non-Residential Total Square Footage (ft²): 33000 Number of Units: N/A
- Architectural Coatings Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)
- Worker Trips Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985

LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	(ormer rings of compass of shares (grams, inne)						
	CH4	N ₂ O	CO ₂	CO ₂ e			
LDGV	0.01267	0.00485	329.19789	330.95831			
LDGT	0.01235	0.00694	407.55001	409.92671			
HDGV	0.05144	0.02676	924.61645	933.86686			
LDDV	0.04552	0.00068	379.44291	380.78290			
LDDT	0.03328	0.00100	428.74284	429.87432			
HDDV	0.02063	0.16392	1259.79671	1309.16119			
MC	0.11763	0.00308	394.15228	398.01144			

4.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

 $VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft²)
800: Conversion Factor square feet to man days (1 ft² / 1 man * day)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{WT}: \ Worker \ Trips \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Off-Gassing Emissions per Phase

 $VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft²)
2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area)
0.0116: Emission Factor (lb/ft²)
2000: Conversion Factor pounds to tons

4.5 Paving Phase

4.5.1 Paving Phase Timeline Assumptions

```
- Phase Start Date
Start Month: 8
Start Quarter: 1
Start Year: 2026
```

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

4.5.2 Paving Phase Assumptions

- General Paving Information Paving Area (ft²): 100000
- Paving Default Settings
 Default Settings Used: Yes
 Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

4.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortan	Mixers Compo	osite [HP: 10] [LF: 0.56]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025		
Pavers Composite []	HP: 81] [LF: 0.	.42]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872		
Paving Equipment	Composite [HP:	89] [LF: 0.36]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388		
Rollers Composite [HP: 36] [LF: 0	.38]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156		
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5		
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839		

Cement and Mortan	· Mixers Composite [H]	P: 10] [LF: 0.56]						
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02313	0.00463	570.16326	572.11992				
Pavers Composite []	Pavers Composite [HP: 81] [LF: 0.42]							
	CH ₄	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02133	0.00427	525.80405	527.60847				
Paving Equipment (Composite [HP: 89] [L]	F: 0.36]						
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02141	0.00428	527.70636	529.51732				
Rollers Composite [HP: 36] [LF: 0.38]							
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02381	0.00476	586.91372	588.92786				
Tractors/Loaders/B	ackhoes Composite [Hl	P: 84] [LF: 0.37]						
	CH4	N ₂ O	CO ₂	CO ₂ e				
Emission Factors	0.02149	0.00430	529.70686	531.52468				

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

4.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Worker \ Trips \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Off-Gassing Emissions per Phase

 $VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location

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

- Activity Title: Construct 2-Bay MC-130J Hangar and Maintenance

- Activity Description:

This facility would comprise a 43,000 SF maintenance facility and a 45,000 SF hanger. No grading required. Assumed as a worst-case that all construction would occur on one year = CY 2026.

-	Activity	Start	Date
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Start Month:1Start Month:2026

- Activity End Date

Indefinite:	False
End Month:	12
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.372436
SO _x	0.002710
NO _x	1.226657
СО	1.531079

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N ₂ O	0.014805

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N ₂ O	0.014805

0.011074 CO₂ 0.014805 CO₂e

5.1 Trenching/Excavating Phase

5.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date	
Start Month:	1
Start Quarter:	1
Start Year:	2026

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

5.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information	
Area of Site to be Trenched/Excavated (ft ²):	1000
Amount of Material to be Hauled On-Site (yd ³):	50
Amount of Material to be Hauled Off-Site (yd ³):	50

- Trenching Default Settings Default Settings Used: Yes

Pollutant	Total Emissions (TONs)
PM 10	0.041748
PM 2.5	0.036288
Pb	0.000000
NH ₃	0.007423

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO ₂ e	339.018625

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO ₂ e	339.018625

Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20 (default)Average Hauling Truck Round Trip Commute (mile):20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

5.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Excavators Compos	Excavators Composite [HP: 36] [LF: 0.38]											
	VOC	SOx	NOx	CO	PM 10	PM 2.5						
Emission Factors	0.39317	0.00542	3.40690	4.22083	0.09860	0.09071						
Other General Indu	strial Equipme	n Composite [H	IP: 35] [LF: 0.3	84]								
	VOC	SOx	NO _x	CO	PM 10	PM 2.5						
Emission Factors	0.45335	0.00542	3.58824	4.59368	0.11309	0.10404						
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]											
	VOC	SOx	NO _x	CO	PM 10	PM 2.5						
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839						

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Excavators Compos	Excavators Composite [HP: 36] [LF: 0.38]										
	CH4	N ₂ O	CO ₂	CO ₂ e							
Emission Factors	0.02381	0.00476	587.02896	589.04350							
Other General Indu	Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]										
	CH ₄	N ₂ O	CO ₂	CO ₂ e							
Emission Factors	0.02385	0.00477	587.87714	589.89459							
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]										
	CH ₄	N ₂ O	CO ₂	CO ₂ e							
Emission Factors	0.02149	0.00430	529.70686	531.52468							

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711

HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

5.2 Building Construction Phase

5.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date Start Month: 2 Start Quarter: 1 Start Year: 2026

Phase Duration
 Number of Month: 10
 Number of Days: 0

5.2.2 Building Construction Phase Assumptions

- General Building Construction Information							
Building Category:	Office or Industrial						
Area of Building (ft ²):	88000						
Height of Building (ft):	50						
Number of Units:	N/A						

- Building Construction Default Settings Default Settings Used: Yes Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day
	Equipment	
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

v ennere Enne	Vehicle Emilder Vehicle Minitare (70)											
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC					
POVs	0	0	0	0	0	100.00	0					

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

5.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite []	HP: 367] [LF:	0.29]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.19758	0.00487	1.83652	1.63713	0.07527	0.06925
Forklifts Composite	[HP: 82] [LF:	0.2]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.24594	0.00487	2.34179	3.57902	0.11182	0.10287
Generator Sets Com	posite [HP: 14]	[LF: 0.74]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.53947	0.00793	4.32399	2.85973	0.17412	0.16019
Tractors/Loaders/Ba	ackhoes Compo	osite [HP: 84] [LF: 0.37]			
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839
Welders Composite	[HP: 46] [LF:	0.45]				
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.46472	0.00735	3.57020	4.49314	0.09550	0.08786

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cranes Composite [Cranes Composite [HP: 367] [LF: 0.29]									
	CH4	N ₂ O	CO ₂	CO ₂ e						
Emission Factors	0.02140	0.00428	527.46069	529.27080						
Forklifts Composite	[HP: 82] [LF: 0.2]									
	CH4	N ₂ O	CO ₂	CO ₂ e						
Emission Factors	0.02138	0.00428	527.09717	528.90603						
Generator Sets Con	posite [HP: 14] [LF: 0	0.74]								
	CH4	N ₂ O	CO ₂	CO ₂ e						
Emission Factors	0.02305	0.00461	568.32694	570.27730						
Tractors/Loaders/B	ackhoes Composite [H]	P: 84] [LF: 0.37]								
	CH4	N ₂ O	CO ₂	CO ₂ e						
Emission Factors	0.02149	0.00430	529.70686	531.52468						
Welders Composite	[HP: 46] [LF: 0.45]									
	CH4	N ₂ O	CO ₂	CO ₂ e						
Emission Factors	0.02305	0.00461	568.29068	570.24091						

- venicie E	Venicle Exhaust & Worker Trips Criteria Fondtant Emission Factors (granis/inne)									
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	NH ₃			
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985			
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207			
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192			
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658			
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711			
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657			
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361			

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

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) BA: Area of Building (ft^2) BH: Height of Building (ft) (0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

 $VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft²)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft³ to trips (0.38 trip / 1000 ft³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VT}: Vender Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

5.3 Architectural Coatings Phase

5.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
 Start Month: 9
 Start Quarter: 1
 Start Year: 2026
- Phase Duration Number of Month: 1 Number of Days: 0

5.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information Building Category: Non-Residential Total Square Footage (ft²): 20000 Number of Units: N/A
- Architectural Coatings Default Settings Default Settings Used: Yes

Average Day(s) worked per week: 5 (default)

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

5.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Criteria Pollutant Emission Factors (grams/mile)

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.3.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

 $VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft²)
800: Conversion Factor square feet to man days (1 ft² / 1 man * day)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions (TONs) \\ VMT_{WT}: \ Worker \ Trips \ Vehicle \ Miles \ Travel (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

- Off-Gassing Emissions per Phase

VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0

VOC_{AC}: Architectural Coating VOC Emissions (TONs)

BA: Area of Building (ft²)
2.0: Conversion Factor total area to coated area (2.0 ft² coated area / total area)
0.0116: Emission Factor (lb/ft²)
2000: Conversion Factor pounds to tons

5.4 Paving Phase

5.4.1 Paving Phase Timeline Assumptions

- Phase Start Date Start Month: 8 Start Quarter: 1 Start Year: 2026
- Phase Duration Number of Month: 0 Number of Days: 3

5.4.2 Paving Phase Assumptions

- General Paving Information Paving Area (ft²): 2000

- Paving Default Settings	
Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

5.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025

Average Hauling Truck Round Trip Commute (mile): 20 (default)

Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872
Rollers Composite [Rollers Composite [HP: 36] [LF: 0.38]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite []	HP: 81] [LF: 0.42]			
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02133	0.00427	525.80405	527.60847
Rollers Composite [HP: 36] [LF: 0.38]			
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

· • • • • • • •	(Grundster Worker Trips eriteria Fondulate Emission Fuetors (Grundstinie)						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH ₄	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

5.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
EF_{POL}: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft²)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location

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

- Activity Title: Construct Parking Area for the STS Squadron Operations Complex

- Activity Description:

Estimated footprint for the parking area is 98,000 sf and paved area somewhat smaller.

- Activity Start Date Start Month: 9

Start Month: 2026

- Activity End Date

Indefinite:	False
End Month:	10
End Month:	2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.024546
SO _x	0.000359
NO _x	0.188328
СО	0.247971

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.001589
N ₂ O	0.000651

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH ₄	0.001589
N ₂ O	0.000651

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date Start Month: 9 Start Quarter: 1 Start Year: 2026

- Phase Duration Number of Month: 1

Pollutant	Total Emissions (TONs)
PM 10	0.983277
PM 2.5	0.007706
Pb	0.000000
NH ₃	0.000485

Pollutant	Total Emissions (TONs)
CO_2	41.087446
CO ₂ e	41.321134

Pollutant	Total Emissions (TONs)
CO ₂	41.087446
CO ₂ e	41.321134

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information Area of Site to be Graded (ft ²):	98000
Amount of Material to be Hauled On-Site (yd ³): Amount of Material to be Hauled Off-Site (yd ³):	0 1000
- Site Grading Default Settings	

Default Settings Used:	Yes
Average Day(s) worked per week:	5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd ³):	20 (default)
Average Hauling Truck Round Trip Commute (mile):	20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41]						
	VOC	SOx	NOx	CO	PM 10	PM 2.5
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction	Equipment Co	mposite [HP: 8	2] [LF: 0.42]			
	VOC	SOx	NOx	CO	PM 10	PM 2.5
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozen	rs Composite [H	IP: 367] [LF: 0	.4]			
	VOC	SOx	NOx	CO	PM 10	PM 2.5
Emission Factors	0.35280	0.00491	3.22260	2.72624	0.14205	0.13069
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Graders Composite [HP: 148] [LF: 0.41] CH₄ N₂O CO₂ **Emission Factors** 0.02153 0.00431 530.81500 532.63663 Other Construction Equipment Composite [HP: 82] [LF: 0.42]

CO₂e

	CH4	N ₂ O	CO ₂	CO ₂ e	
Emission Factors	0.02140	0.00428	527.54121	529.35159	
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]					
	CH4	N ₂ O	CO ₂	CO ₂ e	
Emission Factors	0.02160	0.00432	532.54993	534.37751	
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]					
	CH ₄	N ₂ O	CO ₂	CO ₂ e	
Emission Factors	0.02149	0.00430	529.70686	531.52468	

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

	VOC	SOx	NO _x	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles) HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³) HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³) HC: Average Hauling Truck Capacity (yd³) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³) HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \\ \end{array}$

- Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{WT}: \ Worker \ Trips \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Worker \ Trips \ On \ Road \ Vehicle \ Mixture \ (\%) \\ 2000: \ Conversion \ Factor \ pounds \ to \ tons \end{array}$

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date	
Start Month:	10
Start Quarter:	1
Start Year:	2026
- Phase Duration Number of Mon Number of Days	

6.2.2 Paving Phase Assumptions

- General Paving Information Paving Area (ft²): 80000
- Paving Default Settings
 Default Settings Used: Yes
 Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

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

6.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]							
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.55280	0.00854	4.19778	3.25481	0.16332	0.15025	
Pavers Composite []	Pavers Composite [HP: 81] [LF: 0.42]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.23717	0.00486	2.53335	3.43109	0.12904	0.11872	
Paving Equipment	Paving Equipment Composite [HP: 89] [LF: 0.36]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.18995	0.00487	2.06537	3.40278	0.08031	0.07388	
Rollers Composite [HP: 36] [LF: 0	.38]					
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.54202	0.00541	3.61396	4.09268	0.15387	0.14156	
Tractors/Loaders/B	Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]						
	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Emission Factors	0.18406	0.00489	1.88476	3.48102	0.06347	0.05839	

- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment (Composite [HP: 89] [L	F: 0.36]		
	CH4	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH4	N ₂ O	CO ₂	CO ₂ e

Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/B	ackhoes Composite [H]	P: 84] [LF: 0.37]		
	CH ₄	N ₂ O	CO ₂	CO ₂ e
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26876	0.00110	0.12019	3.90931	0.00411	0.00364	0.04985
LDGT	0.22609	0.00137	0.15215	3.38893	0.00477	0.00422	0.04207
HDGV	0.81083	0.00311	0.59288	10.12260	0.02001	0.01770	0.09192
LDDV	0.09156	0.00128	0.16113	6.23786	0.00361	0.00332	0.01658
LDDT	0.15289	0.00145	0.45734	5.40998	0.00576	0.00530	0.01711
HDDV	0.10433	0.00423	2.49000	1.51556	0.04389	0.04038	0.06657
MC	3.35369	0.00129	0.73753	12.49388	0.02294	0.02030	0.05361

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

	CH4	N ₂ O	CO ₂	CO ₂ e
LDGV	0.01267	0.00485	329.19789	330.95831
LDGT	0.01235	0.00694	407.55001	409.92671
HDGV	0.05144	0.02676	924.61645	933.86686
LDDV	0.04552	0.00068	379.44291	380.78290
LDDT	0.03328	0.00100	428.74284	429.87432
HDDV	0.02063	0.16392	1259.79671	1309.16119
MC	0.11763	0.00308	394.15228	398.01144

6.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

- Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) HP: Equipment Horsepower LF: Equipment Load Factor EF_{POL}: Emission Factor for Pollutant (g/hp-hour) 0.002205: Conversion Factor grams to pounds 2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

 $\begin{array}{l} VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ PA: \ Paving \ Area \ (ft^2) \\ 0.25: \ Thickness \ of \ Paving \ Area \ (ft) \\ (1 / 27): \ Conversion \ Factor \ cubic \ feet \ to \ cubic \ yards \ (1 \ yd^3 / 27 \ ft^3) \\ HC: \ Average \ Hauling \ Truck \ Capacity \ (yd^3) \\ (1 / HC): \ Conversion \ Factor \ cubic \ yards \ to \ trips \ (1 \ trip \ / HC \ yd^3) \\ HT: \ Average \ Hauling \ Truck \ Round \ Trip \ Commute \ (mile/trip) \\ \end{array}$

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase $VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

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

 V_{POL} : Vehicle Emissions (TONs) VMT_{VE}: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF_{POL}: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

 $VOC_P = (2.62 * PA) / 43560 / 2000$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft²)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)² / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

7. Aircraft

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

 Activity Location County: Pima Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MC-130J - LTOs - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 16 MC-130Js that would perform 1,600 LTOs to DM.

- Activity Start Date Start Month: 1 Start Year: 2027

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	3.585420
SO _x	3.076786
NO _x	81.782965
СО	17.849156

Pollutant	Emissions Per Year (TONs)
PM 10	5.510000
PM 2.5	5.040213
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.292624
N ₂ O	0.057484

Pollutant	Emissions Per Year (TONs)			
CO ₂	7033.550033			
CO ₂ e	7058.002543			

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

Pollutant	Emissions Per Year (TONs)		
VOC	0.073864		
SO _x	1.599411		
NO _x	13.421199		
СО	5.455483		

CO ₂ e	7058.002543			
ations (includes Trim Test & APU) part]:				
Pollutant	Emissions Per Year (TONs)			
PM 10	4.140309			
PM 2.5	3.730010			

0.000000

0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pb

 NH_3

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	0.201346	CO_2	4788.426938
N ₂ O	0.039283	CO ₂ e	4805.168435

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.001443
SO _x	0.042954
NO _x	0.387559
СО	0.122258

Pollutant	Emissions Per Year (TONs)		
PM 10	0.095523		
PM 2.5	0.086048		
Pb	0.000000		
NH ₃	0.000000		

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	0.005407	CO_2	128.598895
N ₂ O	0.001055	CO ₂ e	129.048508

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

Pollutant	Emissions Per Year (TONs)
VOC	3.510113
SO _x	1.434421
NO _x	67.974207
СО	12.271416

1	u Equipment (AGE) part].				
	Pollutant	Emissions Per Year (TONs)			
	PM 10	1.274168			
	PM 2.5	1.224155			
	Pb	0.000000			
	NH ₃	0.000000			

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.085870	CO_2	2116.524200
N ₂ O	0.017146	CO ₂ e	2123.785600

7.2 Aircraft & Engines

7.2.1 Aircraft & Engines Assumptions

MC-130J
AE2100D3
Transport - Bomber
No
4

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

7.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	724.00	0.13	0.03	3203.44	3214.64
Approach	880.00	0.13	0.03	3203.44	3214.64
Intermediate	1742.00	0.13	0.03	3203.44	3214.64
Military	2262.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

7.3 Flight Operations

7.3.1 Flight Operations Assumptions

 Flight Operations Number of Aircraft: Flight Operation Cycle Type: Number of Annual Flight Operation Cycles for Number of Annual Trim Test(s) per Aircraft: 	LTO (Landing and Takeoff) • all Aircraft:	16 1600 12
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	13.24	
Approach [Approach] (mins):	3.96	
Climb Out [Intermediate] (mins):	1.44	
Takeoff [Military] (mins):	1.51	
Takeoff [After Burn] (mins):	0	

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
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

7.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

7.4 Auxiliary Power Unit (APU)

7.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Trainiary Tower Chit (III C) (actual)							
Number of APU	Operation Hours	Exempt	Designation	Manufacturer			
per Aircraft	for Each LTO	Source?					

7.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)								
Designation	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5	
A uniliant Damon Unit (ADI								

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (10/117)								
Designation	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e			

7.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year APU_{POL} = APU * OH * LTO * EF_{POL} / 2000

APU_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

7.5 Aircraft Engine Test Cell

7.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell
 Total Number of Aircraft Engines Tested Annually: 64
- Default Settings Used: No

- Annual Run-ups / Test Durations	
Annual Run-ups (Per Aircraft Engine):	1
Idle Duration (mins):	12
Approach Duration (mins):	27
Intermediate Duration (mins):	9
Military Duration (mins):	12
After Burner Duration (mins):	0

7.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

7.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000

TestCellPS_{POL}: Aircraft Engine Test Cell 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: Total Number of Engines (For All Aircraft) ARU: Annual Run-ups (Per Aircraft Engine) 2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

 $TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs) TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) TestCellPS_{INTERMEDIATE}: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

7.6 Aerospace Ground Equipment (AGE)

7.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 1600

- Aerospace Ground Equipment (AGE) (default)

Total Number of	Operation Hours	Exempt	AGE Type	Designation
AGE	for Each LTO	Source?		
1	1	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Air Conditioner	MA-3D - 120hp
1	11	No	Generator Set	A/M32A-86D
1	1	No	Heater	H1
1	3	No	Hydraulic Test Stand	MJ-2A
1	10	No	Light Cart	NF-2
1	0.25	No	Start Cart	A/M32A-60A

7.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

Designation	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
MA-3D - 120hp	7.1	0.053	0.050	4.167	0.317	0.109	0.105
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205

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

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
MA-3D - 120hp	7.1	0.0	0.0	160.2	160.8
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-2A	0.0	0.0	0.0	184.7	185.3
NF-2	0.0	0.0	0.0	23.7	23.8
A/M32A-60A	0.0	0.0	0.0	237.4	238.2

7.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

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

AGE_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr) 2000: Conversion Factor pounds to tons

8. Aircraft

8.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
 - County: Pima

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: MC-130Js - Closed Patterns - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 16 MC-130Js that would perform 5,120 closed patterns at DM.

- Activity Start Date Start Month: 1 Start Year: 2027
- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.061147
SO _x	2.040613
NO _x	17.119035
СО	4.994703

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.256888
N ₂ O	0.050119

Pollutant	Emissions Per Year (TONs)
PM 10	4.232087
PM 2.5	3.808114
Pb	0.000000
NH ₃	0.000000

Pollutant	Emissions Per Year (TONs)
CO_2	6109.327408
CO ₂ e	6130.687092

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)			
VOC	0.061147		PM 10	4.232087			
SO _x	2.040613		PM 2.5	3.808114			
NO _x	17.119035		Pb	0.000000			
CO	4.994703		NH ₃	0.000000			

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.256888	CO_2	6109.327408
N ₂ O	0.050119	CO ₂ e	6130.687092

8.2 Aircraft & Engines

8.2.1 Aircraft & Engines Assumptions

Aircraft & Engine	
Aircraft Designation:	MC-130J
Engine Model:	AE2100D3
Primary Function:	Transport - Bomber
Aircraft has After burn:	No
Number of Engines:	4

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

8.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
Idle	724.00	0.13	0.03	3203.44	3214.64
Approach	880.00	0.13	0.03	3203.44	3214.64
Intermediate	1742.00	0.13	0.03	3203.44	3214.64
Military	2262.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

8.3 Flight Operations

8.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: Flight Operation Cycle Type:	CP (Close Pattern)	16
Number of Annual Flight Operation Cycles for all	- ()	5120
Number of Annual Trim Test(s) per Aircraft:		0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	4.17	
Climb Out [Intermediate] (mins):	3.62	
Takeoff [Military] (mins):	0.53	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

8.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

9. Aircraft

9.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Pima

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: OA-1K - LTOs - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 15 OA-1Ks that would perform 3,000 LTOs to DM. Since ACAM does not have the OA-1K aircraft in its inventory, the analysis chose the U-28A aircraft as a best-fit surrogate, which has a single PT6A-67B turboprop engine rated at 1,200 horsepower or slightly below 1,434 horsepower rated for the PT6A-67AG engine in the OA-1K.

The AGE usages modeled by ACAM for the U-28A and the associated emissions appear to be a substantial overestimate compared to those for the OA-1K.

- Activity Start Date

Start Month:	1
Start Year:	2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	15.392612
SO _x	3.037292
NO _x	134.052463
СО	43.368284

Pollutant	Emissions Per Year (TONs)
PM 10	3.534593
PM 2.5	3.381840
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	
CH ₄	0.204553	
N ₂ O	0.040737	

Pollutant	Emissions Per Year (TONs)
CO ₂	5017.386842
CO ₂ e	5034.645532

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

Pollutant	Emissions Per Year (TONs)		
VOC	5.188600		
SO _x	0.236371		
NO _x	0.926572		
СО	16.679614		

Pollutant Emissions Per Year (TONs) PM 10 0.185369 PM 2.5 0.167048 Pb 0.000000 NH₃ 0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [LTO Flight Operations (includes Trim Test & APU) part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.029756	CO_2	707.662376
N ₂ O	0.005805	CO ₂ e	710.136535

- Activity Emissions of Criteria Pollutants [Test Cell part]:

Pollutant	Emissions Per Year (TONs)
VOC	0.018051
SO _x	0.003383
NO _x	0.017753
СО	0.075266

Pollutant	Emissions Per Year (TONs)
PM 10	0.001659
PM 2.5	0.001502
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [Test Cell part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.000426	CO_2	10.127091
N ₂ O	0.000083	CO ₂ e	10.162498

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	10.185962	PM 10	3.347566
SO _x	2.797539	PM 2.5	3.213291
NO _x	133.108138	Pb	0.000000
СО	26.613404	NH ₃	0.000000

- Giobal Scale Activity Emissions of Greenhouse Gasses [Actospace Ground Equipment (AGE) part].							
Pollutant	Emissions Per Year (TONs)		Pollutant	Emissions Per Year (TONs)			
CH ₄	0.174371		CO_2	4299.597375			
N ₂ O	0.034849		CO ₂ e	4314.346500			

- Global Scale Activity Emissions of Greenhouse Gasses [Aerospace Ground Equipment (AGE) part]:

9.2 Aircraft & Engines

9.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine	
Aircraft Designation:	U-28A
Engine Model:	PT6A-67B
Primary Function:	General - Turboprop
Aircraft has After burn:	No
Number of Engines:	1

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

9.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5	
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24	
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65	
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29	
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23	
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e			
Idle	142.87	0.13	0.03	3203.44	3214.64			
Approach	364.17	0.13	0.03	3203.44	3214.64			
Intermediate	618.87	0.13	0.03	3203.44	3214.64			
Military	681.14	0.13	0.03	3203.44	3214.64			
After Burn	0.00	0.13	0.03	3203.44	3214.64			

9.3 Flight Operations

9.3.1 Flight Operations Assumptions

Flight Operations

 Flight Operation Cycle Type:
 LTO (Landing and Takeoff)
 Number of Annual Flight Operation Cycles for all Aircraft:
 3000
 Number of Annual Trim Test(s) per Aircraft:
 12

 Default Settings Used: No

- Flight Operations TIMs (Time In Mode)	
Taxi [Idle] (mins):	21.55
Approach [Approach] (mins):	7.31
Climb Out [Intermediate] (mins):	1.35

Takeoff [Military] (mins):1.09Takeoff [After Burn] (mins):0

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
Approach (mins):	27
Intermediate (mins):	9
Military (mins):	12
AfterBurn (mins):	0

9.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year $AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000$

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_{IN}} + AEM_{IDLE_{OUT}} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

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

AEPS_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

9.4 Auxiliary Power Unit (APU)

9.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)	- Auxiliary Po	ower Unit (A	PU) (default)
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Number of APU	Operation Hours	Exempt	Designation	Manufacturer
per Aircraft	for Each LTO	Source?		

9.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Criteria Pollutant Emission Factors (lb/hr)

Designation	Fuel Flow	VOC	SOx	NO _x	СО	PM 10	PM 2.5
	·					·	

- Auxiliary Power Unit (APU) Greenhouse Gasses Emission Factors (lb/hr)						
Designation	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e	

9.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year

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

APU_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

9.5 Aircraft Engine Test Cell

9.5.1 Aircraft Engine Test Cell Assumptions

- Engine Test Cell Total Number of Aircraft Engines Tested Annually: 15

- Default Settings Used: No

- Annual Run-ups / Test Durations	
Annual Run-ups (Per Aircraft Engine):	1
Idle Duration (mins):	12
Approach Duration (mins):	27
Intermediate Duration (mins):	9
Military Duration (mins):	12
After Burner Duration (mins):	0

9.5.2 Aircraft Engine Test Cell Emission Factor(s)

- See Aircraft & Engines Emission Factor(s)

9.5.3 Aircraft Engine Test Cell Formula(s)

- Aircraft Engine Test Cell Emissions per Pollutant & Power Setting (TONs) TestCellPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * ARU / 2000

TestCellPS_{POL}: Aircraft Engine Test Cell 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: Total Number of Engines (For All Aircraft) ARU: Annual Run-ups (Per Aircraft Engine) 2000: Conversion Factor pounds to TONs

- Aircraft Engine Test Cell Emissions per Year

 $TestCellPS_{IDLE} + TestCellPS_{APPROACH} + TestCellPS_{INTERMEDIATE} + TestCellPS_{MILITARY} + TestCellPS_{AFTERBURN} + TestCellPS_{AFTERBURN}$

TestCell: Aircraft Engine Test Cell Emissions (TONs) TestCellPS_{IDLE}: Aircraft Engine Test Cell Emissions for Idle Power Setting (TONs) TestCellPS_{APPROACH}: Aircraft Engine Test Cell Emissions for Approach Power Setting (TONs) TestCellPS_{INTERMEDIATE}: Aircraft Engine Test Cell Emissions for Intermediate Power Setting (TONs) TestCellPS_{MILITARY}: Aircraft Engine Test Cell Emissions for Military Power Setting (TONs) TestCellPS_{AFTERBURN}: Aircraft Engine Test Cell Emissions for After Burner Power Setting (TONs)

9.6 Aerospace Ground Equipment (AGE)

9.6.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 3000

- Aerospace Ground Equipment (AGE) (default)

Total Number of	Operation Hours	Exempt	AGE Type	Designation
AGE	for Each LTO	Source?		
1	10	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Air Conditioner	MA-3D - 120hp
1	11	No	Generator Set	A/M32A-86D
1	1	No	Heater	H1
1	3	No	Hydraulic Test Stand	MJ-2A
1	10	No	Light Cart	NF-2
1	0.25	No	Start Cart	A/M32A-60A

9.6.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

Designation	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068
MA-3D - 120hp	7.1	0.053	0.050	4.167	0.317	0.109	0.105
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205

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

- Aerospace Ground Equipment (AGE) Greenhouse Gasses Emission Factors (lb/hr)

Designation	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
MC-1A - 18.4hp	1.1	0.0	0.0	24.5	24.6
MA-3D - 120hp	7.1	0.0	0.0	160.2	160.8
A/M32A-86D	6.5	0.0	0.0	145.6	146.1
H1	0.4	0.0	0.0	8.8	8.8
MJ-2A	0.0	0.0	0.0	184.7	185.3
NF-2	0.0	0.0	0.0	23.7	23.8
A/M32A-60A	0.0	0.0	0.0	237.4	238.2

9.6.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

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

AGE_{POL}: 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_{POL}: Emission Factor for Pollutant (lb/hr) 2000: Conversion Factor pounds to tons

10. Aircraft

10.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Pima

Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: OA-1K - Closed Patterns - Proposed Action Alternative

- Activity Description:

The Proposed Action would add 15 OA-1Ks that would perform 300 closed patterns at DM.

- Activity Start Date Start Month: 1 Start Year: 2028
- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.023092
SO _x	0.014670
NO _x	0.079348
СО	0.167389

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH ₄	0.001847
N ₂ O	0.000360

Pollutant	Emissions Per Year (TONs)
PM 10	0.006594
PM 2.5	0.005964
Pb	0.000000
NH ₃	0.000000

Pollutant	Emissions Per Year (TONs)
CO_2	43.920668
CO ₂ e	44.074225

- Activity Emissions of Criteria Pollutants [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	-	Pollutant	Emissions Per Year (TONs)
VOC	0.023092		PM 10	0.006594
SO _x	0.014670		PM 2.5	0.005964
NO _x	0.079348		Pb	0.000000
СО	0.167389		NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.001847	CO_2	43.920668
N ₂ O	0.000360	CO ₂ e	44.074225

10.2 Aircraft & Engines

10.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

 Aircraft Designation:
 U-28A
 Engine Model:
 PT6A-67B
 Primary Function:
 General Turboprop
 Aircraft has After burn:
 No
 Number of Engines:
 1
- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

10.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SOx	NOx	CO	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e		
Idle	142.87	0.13	0.03	3203.44	3214.64		
Approach	364.17	0.13	0.03	3203.44	3214.64		
Intermediate	618.87	0.13	0.03	3203.44	3214.64		
Military	681.14	0.13	0.03	3203.44	3214.64		
After Burn	0.00	0.13	0.03	3203.44	3214.64		

- Aircraft & Engine	Greenhouse	Gasses	Pollutant	Emission	Factors	(lb/1000lb f	inel)
- miciali & Englic	Ortennouse	Odoboco	1 Unutum	Linnssion	1 actors	(10/1000101	uuu

10.3 Flight Operations

10.3.1 Flight Operations Assumptions

- Flight Operations		
Number of Aircraft:		15
Flight Operation Cycle Type:	CP (Close Pattern)	
Number of Annual Flight Operation Cycle	es for all Aircraft:	300
Number of Annual Trim Test(s) per Aircr	aft:	0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	6.2	
Climb Out [Intermediate] (mins):	4.74	
Takeoff [Military] (mins):	0.43	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

10.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year

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

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

11. Personnel

11.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add
- Activity Location County: Pima Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: Commuting Activities AFSOC Personnel Proposed Action Alternative

- Activity Description: The AFSOC Proposed Action would add 2,119/37/144 military/civilian/contractor personnel to DM.

- Activity Start Date Start Month: 1 Start Year: 2027
- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Fondants:				
Pollutant Emissions Per Year (TONs)				
VOC	3.849865			
SO _x	0.016421			
NO _x	1.823896			
СО	47.728733			

Activity Emissions of Criteria Pollutants:

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.181239
N ₂ O	0.077689

11.2 Personnel Assumptions

- Number of Personnel	
Active Duty Personnel:	2119
Civilian Personnel:	37
Support Contractor Personnel:	1 44
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)

11.3 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

11.4 Personnel Emission Factor(s)

- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)

	VOC	SOx	NOx	СО	PM 10	PM 2.5	NH ₃
LDGV	0.26273	0.00109	0.11133	3.78420	0.00397	0.00351	0.04877
LDGT	0.21524	0.00134	0.13531	3.23488	0.00472	0.00417	0.04019
HDGV	0.76835	0.00311	0.53449	9.47042	0.01916	0.01695	0.08978
LDDV	0.08885	0.00127	0.15487	6.37470	0.00367	0.00338	0.01671
LDDT	0.12791	0.00144	0.43608	5.31960	0.00600	0.00552	0.01697
HDDV	0.09284	0.00416	2.27577	1.46813	0.03749	0.03449	0.06709
MC	3.32621	0.00129	0.73577	12.36217	0.02294	0.02030	0.05395

Pollutant	Emissions Per Year (TONs)
PM 10	0.063118
PM 2.5	0.055791
Pb	0.000000
NH ₃	0.575166

Pollutant	Emissions Per Year (TONs)
CO_2	4900.121232
CO ₂ e	4927.773503

	CH ₄	N ₂ O	CO_2	CO ₂ e		
LDGV	0.01214	0.00475	323.73211	325.44824		
LDGT	0.01144	0.00671	400.53401	402.81761		
HDGV	0.04895	0.02576	926.65228	935.54198		
LDDV	0.04559	0.00068	376.92226	378.26346		
LDDT	0.03251	0.00100	425.48268	426.59454		
HDDV	0.02029	0.16508	1238.44321	1288.14328		
MC	0.11616	0.00308	394.24722	398.06873		

- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)

11.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year $VMT_P = NP \ ^* \ WD \ ^* \ AC$

VMT_P: 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_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

12. Aircraft

12.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

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

- Activity Title: GHGs Emissions for MC-130J Aircraft Operations Beyond Davis-Monthan AFB

- Activity Description:

Beginning in calendar year 2027, the AFSOC mission would fly 1,600 annual sorties between Davis-Monthan AFB and regional airspaces and training areas and within these areas. Each sortie would last for 1.5 hours.

Activity Start Date	
Start Month:	1
Start Year:	2027

- Activity End Date

-

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	l
CH_4	1.126308	CO ₂
N ₂ O	0.219743	CO ₂

Pollutant	Emissions Per Year (TONs)
CO_2	26785.883904
CO ₂ e	26879.533824

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SO _x	0.000000	PM 2.5	0.000000
NO _x	0.000000	Pb	0.000000
СО	0.000000	NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	1.126308	CO_2	26785.883904
N ₂ O	0.219743	CO ₂ e	26879.533824

12.2 Aircraft & Engines

12.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	MC-130J
Engine Model:	AE2100D3
Primary Function:	Transport - Bomber
Aircraft has After burn:	No
Number of Engines:	4

- Aircraft & Engine Surrogate Is Aircraft & Engine a Surrogate? No Original Aircraft Name: Original Engine Name:

12.2.2 Aircraft & Engines Emission Factor(s)

- Arrenart & Englise Criteria I onutant Emission Factors (10/100010 fuct)							
	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	724.00	0.08	1.07	7.58	5.06	3.64	3.28
Approach	880.00	0.06	1.07	7.54	3.89	3.85	3.47
Intermediate	1742.00	0.02	1.07	9.15	1.94	1.46	1.31
Military	2262.00	0.01	1.07	12.46	2.30	1.22	1.10
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH ₄	N ₂ O	CO ₂	CO ₂ e
Idle	724.00	0.13	0.03	3203.44	3214.64
Approach	880.00	0.13	0.03	3203.44	3214.64
Intermediate	1742.00	0.13	0.03	3203.44	3214.64
Military	2262.00	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

12.3 Flight Operations

12.3.1 Flight Operations Assumptions

- Flight Operations Number of Aircraft: Flight Operation Cycle Type:	DC (Destination Cycle)	14			
Number of Annual Flight Operation Cycles for all Aircraft:					
Number of Annual Trim Test(s) per Aircraft:		0			
- Default Settings Used: No - Flight Operations TIMs (Time In Mode)					
Taxi [Idle] (mins):	0				
Approach [Approach] (mins):	0				
Climb Out [Intermediate] (mins):	90				
Takeoff [Military] (mins):	0				
Takeoff [After Burn] (mins):	0				

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

12.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

13. Aircraft

13.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

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

- Activity Title: GHGs Emissions for OA-1K Aircraft Operations other than LTOs - AFSOC Mission - Proposed Action

- Activity Description:

Beginning in calendar year 2028, the AFSOC mission would fly 3,000 annual OA-1K sorties between Davis-Monthan AFB and regional airspaces and training areas. Each sortie would last for 1.5 hours.

-	Activity	Start	Date
-	Activity	Start	Daic

Start Month:	1
Start Year:	2028

- Activity End Date

Indefinite:	Yes
End Month:	N/A
End Year:	N/A

- Activity Emissions of Criteria Pollutants:

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO _x	0.000000
NO _x	0.000000
СО	0.000000

Pollutant	Emissions Per Year (TONs)
PM 10	0.000000
PM 2.5	0.000000
Pb	0.000000
NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	
CH_4	0.187564	(
N ₂ O	0.036594	(

Pollutant	Emissions Per Year (TONs)
CO_2	4460.654054
CO ₂ e	4476.249578

- Activity Emissions of Criteria Pollutants [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000000	PM 10	0.000000
SO _x	0.000000	PM 2.5	0.000000
NO _x	0.000000	Pb	0.000000
СО	0.000000	NH ₃	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH ₄	0.187564	CO_2	4460.654054
N ₂ O	0.036594	CO ₂ e	4476.249578

13.2 Aircraft & Engines

13.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation:	U-28A
Engine Model:	PT6A-67B
Primary Function:	General - Turboprop
Aircraft has After burn:	No
Number of Engines:	1
Number of Engines:	1

- Aircraft & Engine Surrogate	
Is Aircraft & Engine a Surrogate?	Yes
Original Aircraft Name:	OA-1K
Original Engine Name:	PT6A-67AG

13.2.2 Aircraft & Engines Emission Factor(s)

- Micrart & Englise Criteria I ondulit Emission I actors (10/100010 Ider)							
	Fuel Flow	VOC	SOx	NOx	СО	PM 10	PM 2.5
Idle	142.87	61.52	1.07	1.83	183.80	1.38	1.24
Approach	364.17	3.24	1.07	4.59	20.96	0.72	0.65
Intermediate	618.87	0.61	1.07	6.59	6.12	0.32	0.29
Military	681.14	0.45	1.07	6.98	5.73	0.25	0.23
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- Aircraft & Engine Criteria Pollutant Emission Factors (lb/1000lb fuel)

- Aircraft & Engine Greenhouse Gasses Pollutant Emission Factors (lb/1000lb fuel)

	Fuel Flow	CH4	N ₂ O	CO ₂	CO ₂ e
Idle	142.87	0.13	0.03	3203.44	3214.64
Approach	364.17	0.13	0.03	3203.44	3214.64
Intermediate	618.87	0.13	0.03	3203.44	3214.64
Military	681.14	0.13	0.03	3203.44	3214.64
After Burn	0.00	0.13	0.03	3203.44	3214.64

13.3 Flight Operations

13.3.1 Flight Operations Assumptions

	DC (Destination Cycle)	15
Number of Annual Flight Operation Cycles for all Number of Annual Trim Test(s) per Aircraft:	Aircraft:	3000 0
- Default Settings Used: No		
- Flight Operations TIMs (Time In Mode)		
Taxi [Idle] (mins):	0	
Approach [Approach] (mins):	0	
Climb Out [Intermediate] (mins):	90	
Takeoff [Military] (mins):	0	
Takeoff [After Burn] (mins):	0	

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):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

13.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for Flight Operation Cycles per Year AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * FOC / 2000

AEM_{POL}: 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
FOC: Number of Flight Operation Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Flight Operation Cycles per Year

 $AE_{FOC} = AEM_{IDLE_IN} + AEM_{IDLE_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{FOC}: Aircraft Emissions (TONs) AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs) AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs) AEM_{APPROACH}: Aircraft Emissions for Approach Mode (TONs) AEM_{CLIMBOUT}: Aircraft Emissions for Climb-Out Mode (TONs) AEM_{TAKEOFF}: 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_{POL}: 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_{TRIM}: Aircraft Emissions (TONs) AEPS_{IDLE}: Aircraft Emissions for Idle Power Setting (TONs) AEPS_{APPROACH}: Aircraft Emissions for Approach Power Setting (TONs) AEPS_{INTERMEDIATE}: Aircraft Emissions for Intermediate Power Setting (TONs) AEPS_{MILITARY}: Aircraft Emissions for Military Power Setting (TONs) AEPS_{AFTERBURN}: Aircraft Emissions for After Burner Power Setting (TONs)

ATTACHMENT 1-F

GHG Emissions Reports – (1) Total GHG Emissions for A-10 Operations – No Action Alternative and (2) Total GHG Emissions for the 492 SOW Beddown Proposed Action

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location: Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base - No Action Alternative

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

The Proposed Action would stand up an AFSOC Wing at Davis Monthan AFB by transforming the 492 SOW into a Continental United States AFSOC Power Projection Wing. The 492 SOW is currently located at Hurlburt Field in Florida and would relocate to Davis-Monthan AFB in Arizona as part of this transformation. AFSOC units from Cannon AFB, New Mexico; Fort Liberty (Pope Field), North Carolina; Duke Field, Florida; and Joint Base Lewis-McChord, Washington, would transfer as part of the Proposed Action. In addition, ACC personnel from Hurlburt Field and Cannon AFB would transfer to Davis-Monthan AFB to staff the Intelligence Squadron.

Implementation of the Proposed Action would occur over a period of approximately 6 years. Construction would be staged to allow some units and aircraft to arrive at Davis-Monthan AFB by 2026, while other units would arrive no later than 2031.

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2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is

assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

Action-Related Annual GHG Emissions (mton/yr)							
YEAR	CO2	CH4	N2O	CO2e	Threshold	Exceedance	
2026	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2027 [SS Year]	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2028	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2029	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2030	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2031	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2032	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2033	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2034	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2035	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2036	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2037	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2038	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2039	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2040	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2041	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2042	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2043	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2044	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2045	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2046	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	
2047	-95,154	-3.97951408	-0.79488575	-95,490	68,039	No	

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)							
YEAR	CO2	CH4	N2O	CO2e			
2026	90,756,232	249,199	22,164	91,027,596			
2027 [SS Year]	90,756,232	249,199	22,164	91,027,596			
2028	90,756,232	249,199	22,164	91,027,596			
2029	90,756,232	249,199	22,164	91,027,596			
2030	90,756,232	249,199	22,164	91,027,596			
2031	90,756,232	249,199	22,164	91,027,596			
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2035	90,756,232	249,199	22,164	91,027,596			
2036	90,756,232	249,199	22,164	91,027,596			
2037	90,756,232	249,199	22,164	91,027,596			
2038	90,756,232	249,199	22,164	91,027,596			
2039	90,756,232	249,199	22,164	91,027,596			
2040	90,756,232	249,199	22,164	91,027,596			
2041	90,756,232	249,199	22,164	91,027,596			
2042	90,756,232	249,199	22,164	91,027,596			
2043	90,756,232	249,199	22,164	91,027,596			
2044	90,756,232	249,199	22,164	91,027,596			
2045	90,756,232	249,199	22,164	91,027,596			
2046	90,756,232	249,199	22,164	91,027,596			
2047	90,756,232	249,199	22,164	91,027,596			

U.S. Annual GHG Emissions (mton/yr)							
YEAR	CO2	CH4	N2O	CO2e			
2026	5,136,454,179	25,626,912	1,500,708	5,163,581,798			
2027 [SS Year]	5,136,454,179	25,626,912	1,500,708	5,163,581,798			
2028	5,136,454,179	25,626,912	1,500,708	5,163,581,798			
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2047	5,136,454,179	25,626,912	1,500,708	5,163,581,798			

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)							
CO2 CH4 N2O CO2e							
2026-2047	State Total	1,996,637,108	5,482,389	487,614	2,002,607,111		
2026-2047	U.S. Total	113,001,991,938	563,792,057	33,015,568	113,598,799,563		
2026-2047	Action	-2,093,385	-87.54931	-17.487487	-2,100,785		
Percent of State	Fotals	-0.10484552%	-0.00159692%	-0.00358634%	-0.10490252%		
Percent of U.S. T	otals	-0.00185252%	-0.00001553%	-0.00005297%	-0.00184930%		

From a global context, the action's total GHG percentage of total global GHG for the same time period is: -0.00024781%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Chris Crabtree, Air Quality Meteorologist Name, Title Aug 02 2024 Date

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location: Base: DAVIS-MONTHAN AFB State: Arizona County(s): Pima Regulatory Area(s): NOT IN A REGULATORY AREA

b. Action Title: 492nd Special Operations Wing Beddown at Davis-Monthan Air Force Base

c. Project Number/s (if applicable):

d. Projected Action Start Date: 9 / 2025

e. Action Description:

Under the Proposed Action, the DAF would implement the 492 SOW Beddown at Davis-Monthan AFB. This beddown would include establishing AFSOC operations squadrons, developing existing and new infrastructure, and transferring personnel to support and conduct AFSOC missions and operations. Although Phase 2 of a planned A 10 retirement is not part of the Proposed Action, the changes (manpower, aircraft operations, etc.) that result from this retirement are reflected in the project analysis. About 31 new aircraft would be assigned to Davis-Monthan AFB under the Proposed Action.

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f. Point of Contact:	
Name:	Chris Crabtree
Title:	Air Quality Meteorologist
Organization:	Leidos Corporation
Email:	crabtreec@leidos.com
Phone Number:	805-566-6422

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources.

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	Action-Related Annual GHG Emissions (mton/yr)							
YEAR	CO2	CH4	N2O	CO2e	Threshold	Exceedance		
2025	22	0.00080376	0.00064534	22	68,039	No		
2026	1,067	0.03709359	0.03842666	1,080	68,039	No		
2027	40,668	1.68469583	0.36744122	40,820	68,039	No		
2028	49,306	2.04209413	0.43792166	49,488	68,039	No		
2029 [SS Year]	49,306	2.04209413	0.43792166	49,488	68,039	No		
2030	49,306	2.04209413	0.43792166	49,488	68,039	No		
2031	49,306	2.04209413	0.43792166	49,488	68,039	No		
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2034	49,306	2.04209413	0.43792166	49,488	68,039	No		
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2036	49,306	2.04209413	0.43792166	49,488	68,039	No		
2037	49,306	2.04209413	0.43792166	49,488	68,039	No		
2038	49,306	2.04209413	0.43792166	49,488	68,039	No		
2039	49,306	2.04209413	0.43792166	49,488	68,039	No		
2040	49,306	2.04209413	0.43792166	49,488	68,039	No		
2041	49,306	2.04209413	0.43792166	49,488	68,039	No		
2042	49,306	2.04209413	0.43792166	49,488	68,039	No		
2043	49,306	2.04209413	0.43792166	49,488	68,039	No		
2044	49,306	2.04209413	0.43792166	49,488	68,039	No		
2045	49,306	2.04209413	0.43792166	49,488	68,039	No		
2046	49,306	2.04209413	0.43792166	49,488	68,039	No		
2047	49,306	2.04209413	0.43792166	49,488	68,039	No		
2048	49,306	2.04209413	0.43792166	49,488	68,039	No		
2049	49,306	2.04209413	0.43792166	49,488	68,039	No		

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

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2037	90,756,232	249,199	22,164	91,027,596			
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2047	90,756,232	249,199	22,164	91,027,596			
2048	90,756,232	249,199	22,164	91,027,596			
2049	90,756,232	249,199	22,164	91,027,596			

U.S. Annual GHG Emissions (mton/yr)					
YEAR	CO2	CH4	N2O	CO2e	
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798	
2026	5,136,454,179	25,626,912	1,500,708	5,163,581,798	
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2046	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2047	5,136,454,179	25,626,912	1,500,708	5,163,581,798
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GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

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However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	CH4	N2O	CO2e
2025-2049	State Total	2,268,905,804	6,229,987	554,107	2,275,689,899
2025-2049	U.S. Total	128,411,354,475	640,672,792	37,517,691	129,089,544,958
2025-2049	Action	1,126,496	46.648664	10.04079	1,130,654
Percent of State Totals		0.04964929%	0.00074878%	0.00181207%	0.04968400%
Percent of U.S. Totals		0.00087726%	0.00000728%	0.00002676%	0.00087587%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00011737%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Chris Crabtree, Air Quality Meteorologist	Aug 15 2024
Name, Title	Date

ATTACHMENT 1-G

Emissions Estimates for Munitions Usages – Spreadsheet Table for Munitions Usages for A-10 and 492 SOW Beddown Aircraft Operations within Affected Training Areas

EMISSIONS ESTIMATES FOR MUNITIONS USAGE

Table 1-G.1. A-10 Annual Ordnances

Ordnance Type	Usage	Units
Cartridges 30 mm	750,000	EA
2.75-inch Rocket	9,250	EA
BDU-33	9,250	EA
Defensive Chaff	16,000	EA
Flares	39,700	EA

Table 1-G.3. Ordnance Combustive Emission Factors -

Outrous Trees	Pounds per Item					
Ordnance Type	VOC	CO	NOx	SO ₂	PM 10	PM 25
Cartridges 30-75 mm	0.000003	0.000860	0.000200		0.003900	0.002500
2.75-inch Rocket	0.006200	0.530000			0.170000	0.160000
Signals and Simulators (BDU-33)		0.010000	0.01		0.000029	0.000002
Definsive Chaff (Smoke grenade)	0.000003	0.046000	0.001000		0.000029	0.000002
Flares (Smoke grenade)	0.000003	0.046000	0.001000		0.000029	0.000002

Notes: (1) Data are averages of emission factors for munitions categories found in 2007 CEIP Appendix D.9. (2) PM emission factors are for a per blast unit

(3) TOG Emission factors were converted from ROG by multiplying by 0.82

Table 1-G.2. AFSOC Annual Ordnances

	Usage	Units
2.75-inch Rocket	315	EA
Defensive Chaff	6,000	EA
Flares	4,020	EA

Table 1-G.4. A-10 Ordnance Combustive Emissions -

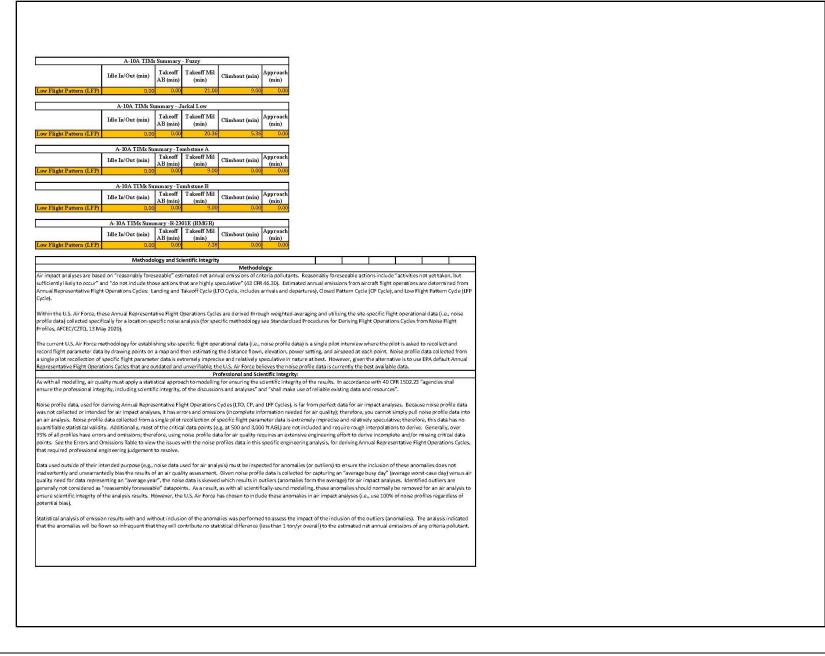
0. L		Ann	ual Emissions	(Pounds/Y	(ear)	
Ordnance Type	VOC	CO	NO _X	SO ₂	PM ₁₀	PM _{2.5}
Cartridges 30 mm	2.24	645.00	150.00		2,925.00	1,875.00
2.75-inch Rocket	57.35	4,902.50			1,572.50	1,480.00
BDU-33		92.50	92.50		0.27	0.02
Defensive Chaff	0.05	736.00	16.00		0.47	0.03
Flares	0.12	1,826.20	39.70		1.17	0.07
Total Emissions - Pounds	60	8,202	298		4,499	3,355
Total Emissions - Tons	0.03	4.10	0.15		2.25	1.68

Table 1-G.5. AFSOC Ordnance Combustive Emissions -

Ordnance Type		Anni	ual Emissions	(Pounds/Y	ear)	
Ordnance Type	VOC	CO	NO _X	SO ₂	PM ₁₀	PM _{2.5}
2.75-inch Rocket	1.95	166.95			53.55	50.40
Defensive Chaff	0.02	276.00	6.00		0.18	0.01
Flares	0.01	184.92	4.02		0.12	0.01
Total Emissions - Pounds	2	628	10		54	50
Total Emissions - Tons	0.001	0.31	0.01		0.03	0.03

ATTACHMENT 1-H

Estimates of Time In Mode Data for Aircraft Operations at (1) Davis-Monthan AFB, (2) Affected Airspaces and Training Areas, and (3) Aircraft Sorties Between Davis-Monthan AFB and Affected Airspaces and Training Areas and Operations within these Areas, Regardless of Aircraft Altitude



	A-10A TIMs Summar			out Approach	1								
	Idle In/Out (min)	AB (min) Mil (nin) (min	i) (min)									
Destination Cycle (DC)	0.00	0.00 4	18.36 <mark>2</mark> 9	9.64 0.0	U								
	Methodology a	nd Scientific Inte	grity						-			<u> </u>	
			61	M	ethodology:								
Air impact analyses are ba	Cherry and the second				CONTRACTOR OF A CARDING AND A						•		C11201000000000000
likely to occur" and "do no Flight Operations Cycles: 1		the second se						and the second s				inual kepr	resentative
Within the U.S. Air Force, 1	hese Annual Representa	itive Elight Opera	tions Cycles :	are derived thr	ough weighter	l-averagin	e and utilizine	the site-specific	flight opera	ational o	lata (i e	noise pro	ofile data)
collected specifically for a								a			20	S	(18.1)
2020).													
The current U.S. Air Force		0	0	and was service as the service of the service		24 GUN GUN COMPACINE			Control Active Strategy and Control				0
parameter data by drawin of specific flight paramete						50		en encourt II av				· ·	
Cycles that are outdated a						0		to use Errracia		tep:ese	induite i	Bittoper	
				Professional	and Scientific	ntegrity							
As with all modelling, air q	uality must apply a statis	stical approach to	modelling f				e results. In ad	ccordance with	40 CFR 1502	2.23 ″ag	encies sh	nall ensure	e the
professional integrity, incl	iding scientific integrity,	of the discussion	s and analys	es" and "shall r	nake use of rel	liable exis	ting data and r	resources".					
Noise profile data, used fo	deriving Annual Repres	entative Flight O	perations Cy	cles (LTO, CP, a	nd LFP Cycles)	, is far fro	n perfect data	a for air impact a	analyses. Be	ecause n	ioise pro	file data v	vas not
collected or intended for a Noise profile data collecte													
validity. Additionally, mos	and the second		Contraction of the second s										
omissions; therefore, usin													
view the issues with the n	lise profiles data in this	specific engineeri	ng analysis, t	for deriving Ani	iual Represent	ative Filgi	it Operations	Cycles, that requ	uirea protes	sional e	ngineeri	ng Juagen	nent to
resolve.				ic) must be incr	ected for anor	nalies (or	outliers) to en	sure the inclusi	on of these	anomali	es does	not inadv	ertently and
resolve.	intended nurnose (e.g.	noise data used fi	or air analysi										
20 C					d for capturing	gan "aver:	age busy day"		case uay) ve			den an die e	
resolve. Data used outside of their unwarrantedly bias the res representing an "average	ults of an air quality ass ear", the noise data is s	essment. Given n kewed which resu	ioise profile i ults in outlier	data is collecte rs (anomalies fo	rm the averag	e) for air i	mpact analyse		utliers are ge				C + L
resolve. Data used outside of their unwarrantedly bias the re:	ults of an air quality ass rear", the noise data is s datapoints. As a result,	essment. Given n kewed which resu as with all scienti	ioise profile ults in outlier fically-sound	data is collecte rs (anomalies fo modelling, the	orm the averag se anomalies s	e) for air i should nor	mpact analyse mally be remo	oved for an air a	utliers are ge malysis to er	nsure sc			f the
resolve. Data used outside of their unwarrantedly bias the re- representing an "average "reassembly foreseeable" analysis results. However,	ults of an air quality ass ear", the noise data is s datapoints. As a result, the U.S. Air Force has ch	essment. Given n kewed which resu as with all scienti nosen to include t	ioise profile ults in outlier fically-sound hese anoma	data is collecte rs (anomalies fo modelling, the lies in air impa	orm the averag se anomalies s st analyses (i.e	e) for air i should nor ., use 100	mpact analyse mally be remo % of noise pro	oved for an air a files regardless	utliers are ge malysis to er of potential	nsure sc bias).	ientific ir	ntegrity of	
resolve. Data used outside of their unwarrantedly bias the re: representing an "average "reassembly foreseeable"	ults of an air quality ass rear", the noise data is s datapoints. As a result, the U.S. Air Force has ch ion results with and wit	essment. Given n kewed which resu as with all scientii nosen to include t hout inclusion of	ioise profile ilts in outlier fically-sound these anoma the anomalie	data is collecte rs (anomalies fo modelling, the lies in air impa- es was perform	orm the averag se anomalies s analyses (i.e ed to assess th	e) for air i should nor ., use 100 ne impact	mpact analyse mally be remo % of noise pro of the inclusio	oved for an air a files regardless on of the outliers	utliers are ge inalysis to er of potential s (anomalies	nsure sc bias).). The a	ientific i inalysis i	ntegrity of ndicated t	
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resolve. Data used outside of their unwarrantedly bias the rei representing an "average" "reassembly foreseeable" analysis results. However, Statistical analysis of emis:	ults of an air quality ass rear", the noise data is s datapoints. As a result, the U.S. Air Force has ch ion results with and wit	essment. Given n kewed which resu as with all scientii nosen to include t hout inclusion of	ioise profile ilts in outlier fically-sound these anoma the anomalie	data is collecte rs (anomalies fo modelling, the lies in air impa- es was perform	orm the averag se anomalies s analyses (i.e ed to assess th	e) for air i should nor ., use 100 ne impact	mpact analyse mally be remo % of noise pro of the inclusio	oved for an air a files regardless on of the outliers	utliers are ge inalysis to er of potential s (anomalies	nsure sc bias).). The a	ientific i inalysis i	ntegrity of ndicated t	
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resolve. Data used outside of their unwarrantedly bias the re representing an "average "reassembly foreseeable" analysis results. However, Statistical analysis of emis:	ults of an air quality ass rear", the noise data is s datapoints. As a result, the U.S. Air Force has ch ion results with and wit	essment. Given n kewed which resu as with all scientii nosen to include t hout inclusion of	ioise profile ilts in outlier fically-sound these anoma the anomalie	data is collecte rs (anomalies fo modelling, the lies in air impa- es was perform	orm the averag se anomalies s analyses (i.e ed to assess th	e) for air i should nor ., use 100 ne impact	mpact analyse mally be remo % of noise pro of the inclusio	oved for an air a files regardless on of the outliers	utliers are ge inalysis to er of potential s (anomalies	nsure sc bias).). The a	ientific i inalysis i	ntegrity of ndicated t	

	C-130J 7	IMs Summa	ry		
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
LTO Flight	0.00	0.00	1.51	1.44	3.96
LTO Taxi	13.24	0.00	0.00	0.00	0.00
Total LTO	13.24	0.00	1.51	1.44	3.96

Methodology and Scientific Integrity

Methodology:

Air impact analyses are based on "reasonably foreseeable" estimated net annual emissions of criteria pollutants. Reasonably foreseeable actions include "activities not yet taken, but sufficiently likely to occur" and "do not include those actions that are highly speculative" (43 CFR 46.30). Estimated annual emissions from aircraft flight operations are determined from Annual Representative Flight Operations Cycles: Landing and Takeoff Cycle (LTO Cycle, includes arrivals and departures), Closed Pattern Cycle (CP Cycle), and Low Flight Pattern Cycle (LFP Cycle).

Within the U.S. Air Force, these Annual Representative Flight Operations Cycles are derived through weighted-averaging and utilizing the site-specific flight operational data (i.e., noise profile data) collected specifically for a location-specific noise analysis (for specific methodology see Standardized Procedures for Deriving Flight Operations Cycles from Noise Flight Profiles, AFCEC/CZTQ, 13 May 2020).

The current U.S. Air Force methodology for establishing site-specific flight operational data (i.e., noise profile data) is a single pilot interview where the pilot is asked to recollect and record flight parameter data by drawing points on a map and then estimating the distance flown, elevation, power setting, and airspeed at each point. Noise profile data collected from a single pilot recollection of specific flight parameter data is extremely imprecise and relatively speculative in nature at best. However, given the alternative is to use EPA default Annual Representative Flig Operations Cycles that are outdated and unverifiable; the U.S. Air Force believes the noise profile data is currently the best available data.

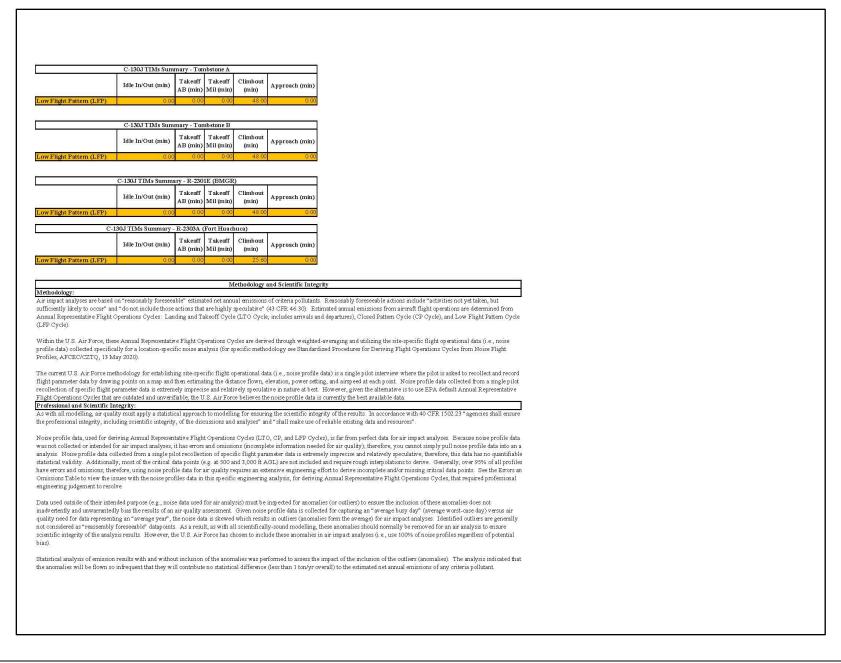
Professional and Scientific Integrity:

As with all modelling, air quality must apply a statistical approach to modelling for ensuring the scientific integrity of the results. In accordance with 40 CFR 1502.23 "agencies shall ensure the professional integrity, including scientific integrity, of the discussions and analyses" and "shall make use of reliable existing data and resources".

Noise profile data, used for deriving Annual Representative Flight Operations Cycles (LTO, CP, and LFP Cycles), is far from perfect data for air impact analyses. Because noise profile data wa not collected or intended for air impact analyses, it has errors and omissions (incomplete information needed for air quality); therefore, you cannot simply pull noise profile data into an air analysis. Noise profile data collected from a single pilot recollection of specific flight parameter data is extremely imprecise and relatively speculative; therefore, this data has no quantifiable statistical validity. Additionally, most of the critical data points (e.g. at 500 and 3,000 fl AGL) are not included and require rough interpolations to derive. Generally, over 95% of all profiles have errors and omissions Table to view the issues with the noise profile data in this specific engineering analysis, for deriving Annual Representative Flight Operations Cycles, that required professional engineering judgement to resolve.

Data used outside of their intended purpose (e.g., noise data used for air analysis) must be inspected for anomalies (or outliers) to ensure the inclusion of these anomalies does not inadvertently and unwarrantedly bias the results of an air quality assessment. Given noise profile data is collected for capturing an "average busy day" (average worst-case day) versus air quality need for dat representing an "average year", the noise data is skewed which results in outliers (normalies form the average) for air impact analyses. Identified outliers are generally not considered as "reassembly foreseeable" datapoints. As a result, as with all scientifically-sound modelling, these anomalies should normally be removed for an air analysis to ensure scientific integrity of the analysis results. However, the U.S. Air Force has chosen to include these anomalies in air impact analyses (i.e., use 100% of noise profiles regardless of potential bias).

Statistical analysis of emission results with and without inclusion of the anomalies was performed to assess the impact of the inclusion of the outliers (anomalies). The analysis indicated that the anomalies will be flown so infrequent that they will contribute no statistical difference (less than 1 ton/yr overall) to the estimated net annual emissions of any criteria pollutant.



	C-130J TIN	Is Summary GHG en	nissions							
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min					
Destination Cycle (DC)	0.00	0.00	0.00	90.00	0.00					
			Methodo	ology and Sc	ientific Integrity	2				
/lethodology:										
light Operations Cycles: Within the U.S. Air Force	ot include those actions t Landing and Takeoff C , these Annual Represent a location-specific noise a	ycle (LTO Cycle, inclu ative Flight Operations	des arrivals and s Cycles are deri	departures), wed through	Closed Pattern C weighted-averag	ycle (CP Cyc ng and utilizi	le), and Low ing the site-sp	Flight Patterr ecific flight c	Cycle (LFP Cyperational data	cle). (i.e., noise profile
arameter data by drawing	g points on a map and the	en estimating the distan	ice flown, elevat	tion, power s	etting, and airspe	ed at each poi	int. Noise pro	file data coll	ected from a sin	gle pilot recollecti
parameter data by drawing specific flight parameter of that are outdated and unver- Professional and Scienti As with all modelling, air	g points on a map and the lata is extremely impreci- srifiable; the U.S. Air For fic Integrity: quality must apply a stat	en estimating the distant se and relatively specul ree believes the noise p istical approach to mod	tee flown, elevat lative in nature a rofile data is cur lelling for ensur	tion, power s at best. How rrently the be ing the scien	etting, and airspe ever, given the al est available data. tific integrity of t	ed at each poi ternative is to he results. In	int. Noise pro use EPA defa accordance w	file data coll- ault Annual F	ected from a sin epresentative F	gle pilot recollecti light Operations C
parameter data by drawing specific flight parameter of hat are outdated and unvol- Professional and Scienti As with all modelling, air professional integrity, inc Noise profile data, used for sollected or intended for a Noise profile data collector validity. Additionally, mo- prissions; therefore, usin view the issues with the n	g points on a map and the lata is extremely impreci- rifiable; the U.S. Air For fic Integrity: quality must apply a stat luding scientific integrity or deriving Annual Repre- ir impact analyses, it has def from a single pilot rec- ost of the critical data poi g noise profile data for ai	en estimating the distant se and relatively specul ce believes the noise p istical approach to moo , of the discussions and errors and omissions (ollection of specific flig nts (e.g. at 500 and 3,0 r quality requires an ex-	ace flown, eleval lative in nature a rofile data is cur delling for ensur d analyses" and tions Cycles (LT incomplete info ght parameter da 00 ft AGL) are tcensive enginee	tion, power s at best. How rrently the be- ing the scien "shall make "O, CP, and I rrmation need at is extreme not included tring effort to	etting, and airspe ever, given the al est available data. tific integrity of t use of reliable ex LFP Cycles), is fa led for air quality ely imprecise and and require roug o derive incomple	ed at each poi ternative is to he results. In sting data and r from perfec); therefore, y relatively spe n interpolation te and/or miss	int. Noise pro- ouse EPA defa accordance w d resources". at data for air i you cannot sin eculative; ther ns to derive. (sing critical da	file data coll- ault Annual F rith 40 CFR mpact analys ply pull nois efore, this da Generally, ov ta points. So	ected from a sin tepresentative F 1502.23 "agenci es. Because no e profile data ir ta has no quanti er 95% of all pr ee the Errors and	gle pilot recollecti light Operations C es shall ensure the se profile data wa to an air analysis. fiable statistical ofiles have errors a t Omissions Table
The current U.S. Air Force parameter data by drawing specific flight parameter of that are outdated and unver- Professional and Scienti As with all modelling, air professional integrity, ince Noise profile data, used for collected or intended for a Noise profile data collecter validity. Additionally, mo- omissions; therefore, usin view the issues with the n resolve. Data used outside of their inwarrantedly bias the res- representing an "average of foreseeable" datapoints.	g points on a map and the lata is extremely impreci- rifiable; the U.S. Air For fic Integrity: quality must apply a stat luding scientific integrity or deriving Annual Repre- tir impact analyses, it has ed from a single pilot rec- ost of the critical data poi g noise profile data for ai oise profiles data in this s- intended purpose (e.g., r sults of an air quality assa year", the noise data is sk As a result, as with all sci	en estimating the distant se and relatively specul ce believes the noise p istical approach to mood , of the discussions and errors and omissions (oblection of specific flig nts (e.g. at 500 and 3,0 r quality requires an ex- specific engineering an coise data used for air a essment. Given noise p tewed which results in entifically-sound mode	the flown, eleval lative in nature a rofile data is cur- delling for ensur d analyses" and tions Cycles (LT incomplete info ght parameter da 00 ft AGL) are : tensive enginee alysis, for derivi nalysis) must be profile data is co outliers (anomal elling, these anon	tion, power s at best. How rrently the be- ing the scien "shall make to "O, CP, and I rmation need ta is extreme not included ring effort to ing Annual F e inspected for illected for ca lies form the malies should	etting, and airspe ever, given the al est available data. titlic integrity of f use of reliable ex LFP Cycles), is fa ded for air quality ely imprecise and and require roug o derive incomple Representative Fli or anomalies (or o apturing an "aver average) for air i d normally be rer	ed at each poi ternative is to he results. In sting data and r from perfec); therefore, y relatively spen interpolation te and/or miss ght Operation utiliers) to em- age busy day" mpact analyse toved for an a	int. Noise pro- puse EPA defa accordance w d resources". et data for air i vou cannot sin eculative; ther ns to derive. (sing critical da is Cycles, that sure the inclus ' (average wor es. Identified air analysis to	file data coll- ault Annual F with 40 CFR mpact analys apply pull nois efore, this da Generally, ov ta points. So required pro- sion of these st-case day) outliers are g ensure scien	ected from a sin tepresentative F (502.23 "agenci es. Because no e profile data ir ta has no quanti er 95% of all pr se the Errors and fessional engine anomalies does versus air qualit enerally not con	gle pilot recollecti light Operations C es shall ensure the se profile data wa to an air analysis. fiable statistical offles have errors : I Omissions Table ering judgement t not inadvertently a y need for data sidered as "reasse

	OA-1K	TIMs Summa	ary		
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
LTO Flight	0.00	0.00	1.09	1.35	7.3
LTO Taxi	21.55	0.00	0.00	0.00	0.0
Total LTO	21.55	0.00	1.09	1.35	7.3

Methodology and Scientific Integrity

Methodology:

Air impact analyses are based on "reasonably foreseeable" estimated net annual emissions of criteria pollutants. Reasonably foreseeable actions include "activities not yet taken, but sufficiently likely to occur" and "do not include those actions that are highly speculative" (43 CFR 46.30). Estimated annual emissions from aircraft flight operations are determined from Annual Representative Flight Operations Cycles: Landing and Takeoff Cycle (LTO Cycle, includes arrivals and departures), Closed Pattern Cycle (CP Cycle), and Low Flight Pattern Cycle (LFP Cycle).

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Professional and Scientific Integrity:

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Data used outside of their intended purpose (e.g., noise data used for air analysis) must be inspected for anomalies (or outliers) to ensure the inclusion of these anomalies does not inadvertently and unwarrantedly bias the results of an air quality assessment. Given noise profile data is collected for capturing an "average busy day" (average worst-case day) versus air quality need for data representing an "average year", the noise data is skewed which results in outliers (anomalies form the average) for air impact analyses. Identified outliers are generally not considered as "reassembly foreseeable" datapoints. As a result, as with all scientifically-sound modelling, these anomalies should normally be removed for an air analysis to ensure scientific integrity of the analysis results. However, the U.S. Air Force has chosen to include these anomalies in air impact analyses (i.e., use 100% of noise profiles regardless of potential bias).

Statistical analysis of emission results with and without inclusion of the anomalies was performed to assess the impact of the inclusion of the outliers (anomalies). The analysis indicated that the anomalies will be flown so infrequent that they will contribute no statistical difference (less than 1 ton/yr overall) to the estimated net annual emissions of any criteria pollutant.

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