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_2e	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 (CO_2e)

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 http://www.492sow-beddown-eis.com. 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.

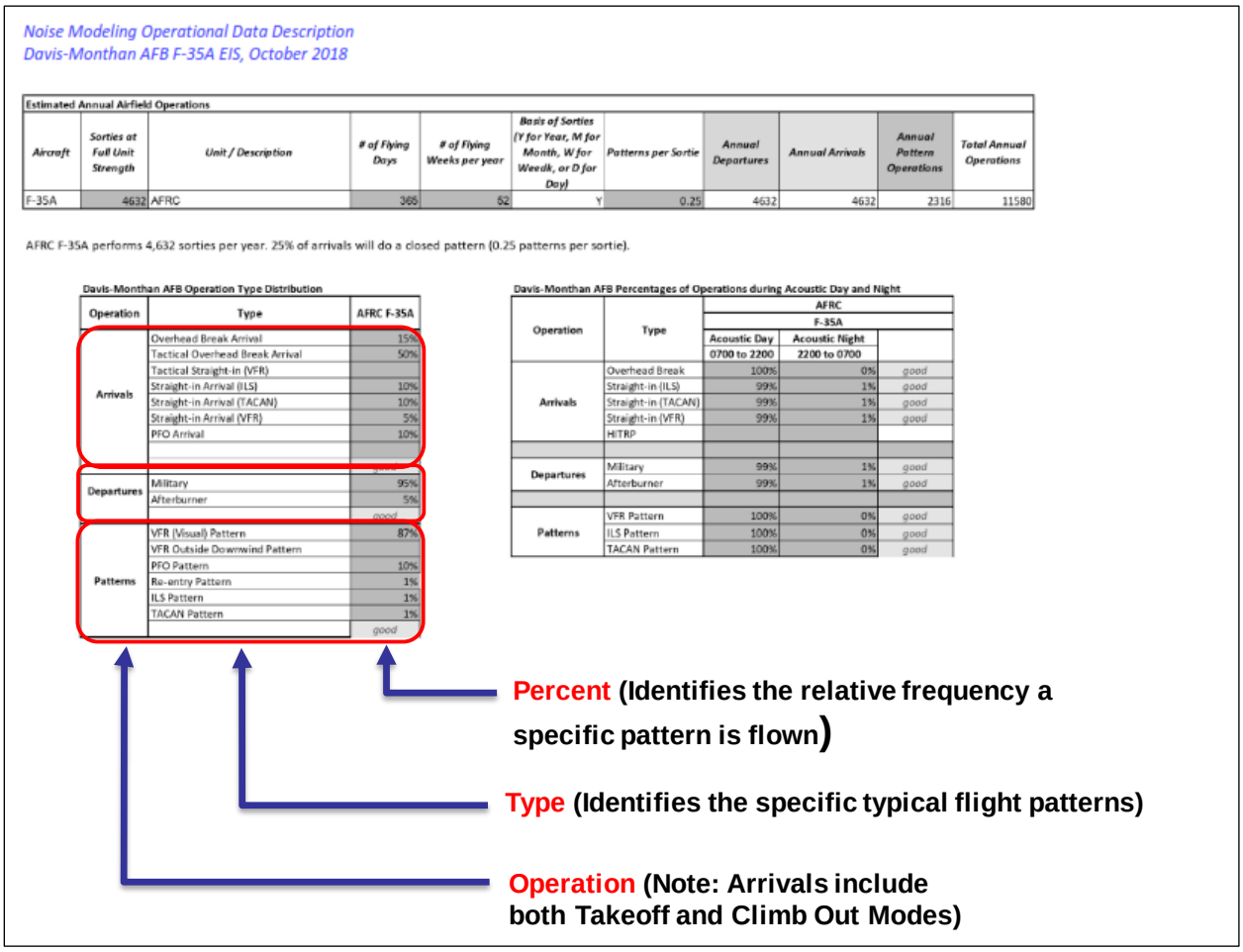
Standardized Procedures for Deriving Landing and Takeoff Cycles from Noise Profiles

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



Noise Modeling Operational Data Description
Davis-Monthan AFB F-35A EIS, October 2018

Estimated Annual Airfield Operations

Aircraft	Sorties at Full Unit Strength	Unit / Description	# of Flying Days	# of Flying Weeks per year	Basis of Sorties (Y for Year, M for Month, W for Weekk, or D for Day)	Patterns per Sortie	Annual Departures	Annual Arrivals	Annual Pattern Operations	Total Annual Operations
F-35A	4632	AFRC	365	52	Y	0.25	4632	4632	2316	11580

AFRC F-35A performs 4,632 sorties per year. 25% of arrivals will do a closed pattern (0.25 patterns per sortie).

Davis-Monthan AFB Operation Type Distribution

Operation	Type	AFRC F-35A
Arrivals	Overhead Break Arrival	15%
	Tactical Overhead Break Arrival	50%
	Tactical Straight-in (VFR)	
	Straight-in Arrival (ILS)	10%
	Straight-in Arrival (TACAN)	10%
	Straight-in Arrival (VFR)	5%
	PFO Arrival	10%
Departures	Military	95%
	Afterburner	5%
Patterns	VFR (Visual) Pattern	87%
	VFR Outside Downwind Pattern	
	PFO Pattern	10%
	Re-entry Pattern	1%
	ILS Pattern	1%
	TACAN Pattern	1%

Davis-Monthan AFB Percentages of Operations during Acoustic Day and Night

Operation	Type	AFRC F-35A Acoustic Day 0700 to 2200	AFRC F-35A Acoustic Night 2200 to 0700	
Arrivals	Overhead Break	100%	0%	good
	Straight-in (ILS)	99%	1%	good
	Straight-in (TACAN)	99%	1%	good
	Straight-in (VFR)	99%	1%	good
	HITRP			
Departures	Military	99%	1%	good
	Afterburner	99%	1%	good
Patterns	VFR Pattern	100%	0%	good
	ILS Pattern	100%	0%	good
	TACAN Pattern	100%	0%	good

Percent (Identifies the relative frequency a specific pattern is flown)

Type (Identifies the specific typical flight patterns)

Operation (Note: Arrivals include both Takeoff and Climb Out Modes)

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.

Example Noise Approach Profile

Point	Distance (ft)	Height (ft)	Power (% ETR)	Speed (kts)
a	209,442	10000	15	300
b	73,060	1500	35	300
c	42,864	1500	15	300
d	31,898	1500	35	210
e	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

Missing 3,000 ft critical point

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.

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

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

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

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

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

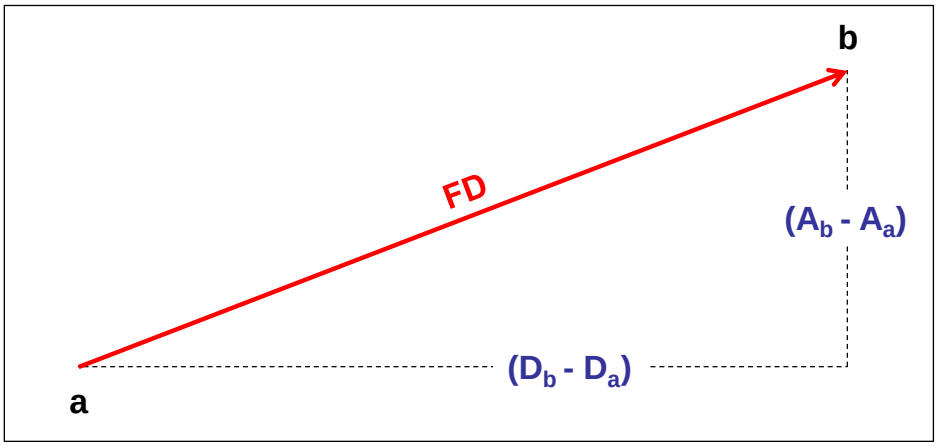
$$P = \frac{300 - 300}{1500 - 10000} \times (3000 - 1500) + 300 = \mathbf{300\ Kts}$$

Example Noise Profile with Extrapolation of Critical Point

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)
a	209,442	10000	15	Variable	300
	97,127	3000	31		300
b	73,060	1500	35	Variable	300
c	42,864	1500	15	Variable	300
d	31,898	1500	35	Variable	210
e	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

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.

$$\boldsymbol{FD = \sqrt{(D_b - D_a)^2 + (A_b - A_a)^2}}$$



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

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

Example Noise Profile with Derived Flight Distances

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)
a	209,442	10000	15	Variable	300	
	97,127	3000	31		300	
b	73,060	1500	35	Variable	300	24114
c	42,864	1500	15	Variable	300	30196
d	31,898	1500	35	Variable	210	10966
e	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

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.

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

Example Noise Profile with Derived Flight Distances and Air Speed

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)
a	209,442	10000	15	Variable	300		
	97,127	3000	31		300		
b	73,060	1500	35	Variable	300	24114	506
c	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

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.

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

Example Noise Profile with Derived Segment Times

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)
a	209,442	10000	15	Variable	300			
	97,127	3000	31		300			
b	73,060	1500	35	Variable	300	24114	506	47.62
c	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

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)

Example Noise Profile with Derived Takeoff and Climb Out TIMs

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)	
a	0	0	75	75% ETR	0				
b	3,000	0	100	Variable	150	3000	253	11.85	
c	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	
e	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 Approach TIM

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)	
a	209,442	10000	15	Variable	300				
	97,127	3000	31		300				
b	73,060	1500	35	Variable	300	24114	506	47.62	
c	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	Approach = 232 sec

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.

Example of Operation Type TIMs Tabulated by Modes

Mode	Arrivals					Departures	
	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%

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).

$$TIM_{Approach_{F35Ao03}} = 217 \times 15\% = 32.57\ sec$$

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

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

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

$$\text{Representative TIM}_{Approach} = 32.57 + 116.06 + 23.94 + 11.51 + 3.39 = 187.47\ sec$$

Example of Weighted Times Based on Noise Profiles (seconds)

Mode	Arrivals					Departures		Noise LTO
	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 Representative TIMs

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.

Example Noise Profile with Derived Takeoff and Climb Out TIMs

Point	Distance (ft)	Height (ft)	Power (% ETR)		Speed (kts)	True Flight Distance (ft)	Air Speed (fps)	Segment Time (sec)	
a	0	0	75	75% ETR	0				
b	3,000	0	100	Variable	150	3000	253	11.85	← Millitary Take Off
c	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
e	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

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

Mode	% Thrust Range		Arrivals					Departures	
			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	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).

$$TIM_{Approach_{F35Ao03}} = 128 \times 15\% = 19.2\ sec$$

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

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

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

$$\textbf{Representative TIM}_{Approach} = 19.2 + 71.5 + 23.9 + 11.5 = 126.1\ sec$$

$$\textbf{Representative TIM}_{Mode} = (\Sigma\ \textbf{TIM}_{segement})\ \textbf{x Percent}_{Mode}$$

Example of Weighted Times Based on Noise Profiles (seconds)

Mode	% Thrust Range		Arrivals					Departures		Noise LTO
			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	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	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.

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

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

$$\textbf{\textit{Representative TIM}}_{\textbf{Approach}} = \frac{(187 + 126)}{2} = 157\ sec = 2.61\ min$$

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 http://www.492sow-beddown-eis.com/.

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 CO_2e emissions inventories for the United Stated and State that encompasses the Proposed Action (Arizona)
- A Relative Significance Assessment that compares total CO_2e emissions from the project alternative to the global, United States, and State CO_2e 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: https://aqhelp.com/acam.html.

USEPA. (2024). *AP-42: Compilation of Air Emissions Factors from Stationary Sources. Chapter 15 - Ordnance Detonation*. Available online: https://www.epa.gov/air-emissions-factors-and-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
CO	-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
CO	-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 — Aug 02 2024

Name, Title — **Date**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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
CO	-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_2O	-0.185538

Pollutant	Emissions Per Year (TONs)
CO_2	-22737.218390
CO_2e	-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_2O	-0.097561

Pollutant	Emissions Per Year (TONs)
CO_2	-11892.335332
CO_2e	-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
CO	-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)
CH_4	-0.004754
N_2O	-0.000928

Pollutant	Emissions Per Year (TONs)
CO_2	-113.068618
CO_2e	-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

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)
CH_4	-0.435194
N_2O	-0.087049

Pollutant	Emissions Per Year (TONs)
CO_2	-10731.814440
CO_2e	-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	SO_x	NO_x	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_2O	CO_2	CO_2e
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

- Flight Operations

Number of Aircraft: 32
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 10320
Number of Annual Trim Test(s) per Aircraft: 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 per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

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	CH_4	N_2O	CO_2	CO_2e

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

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

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 AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
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)

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

Designation	Fuel Flow	VOC	SO_x	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
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_2O	CO_2	CO_2e
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
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_2O	-0.002455

Pollutant	Emissions Per Year (TONs)
CO_2	-299.206336
CO_2e	-300.252434

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

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 [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.012581
N_2O	-0.002455

Pollutant	Emissions Per Year (TONs)
CO_2	-299.206336
CO_2e	-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	SO_x	NO_x	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_2O	CO_2	CO_2e
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 for all Aircraft: 1714
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

Pollutant	Emissions Per Year (TONs)
PM 10	-0.027440
PM 2.5	-0.024287
Pb	0.000000
NH_3	-0.254462

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.081841
N_2O	-0.034197

Pollutant	Emissions Per Year (TONs)
CO_2	-2129.716318
CO_2e	-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)

- 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)

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	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

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

	CH_4	N_2O	CO_2	CO_2e
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

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
_X_ not applicable

Conformity Analysis Summary:

2026

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		
CO	-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		
CO	-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		
CO	-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		
CO	-8.094		
SOx	-1.591	100	No

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 — Aug 02 2024

Name, Title — **Date**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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:

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

- Activity Emissions of Criteria Pollutants:

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:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.212165
N_2O	-0.041393

Pollutant	Emissions Per Year (TONs)
CO_2	-5045.706310
CO_2e	-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 [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.212165
N_2O	-0.041393

Pollutant	Emissions Per Year (TONs)
CO_2	-5045.706310
CO_2e	-5063.347318

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	SO_x	NO_x	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_2O	CO_2	CO_2e
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

- 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): 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)
$AEPS_{INTERMEDIATE}$: 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? 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
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
CO	-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)
CH_4	-0.200318
N_2O	-0.039082

Pollutant	Emissions Per Year (TONs)
CO_2	-4763.973244
CO_2e	-4780.629245

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

Pollutant	Emissions Per Year (TONs)
VOC	-1.656175
SO_x	-1.591243
NO_x	-15.397169
CO	-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 [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.200318
N_2O	-0.039082

Pollutant	Emissions Per Year (TONs)
CO_2	-4763.973244
CO_2e	-4780.629245

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	SO_x	NO_x	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_2O	CO_2	CO_2e
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: 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	-0.151023
SO_x	-1.346621
NO_x	-13.466207
CO	-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)
CH_4	-0.169523
N_2O	-0.033074

Pollutant	Emissions Per Year (TONs)
CO_2	-4031.606123
CO_2e	-4045.701591

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

Pollutant	Emissions Per Year (TONs)
VOC	-0.151023
SO_x	-1.346621
NO_x	-13.466207
CO	-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 [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.169523
N_2O	-0.033074

Pollutant	Emissions Per Year (TONs)
CO_2	-4031.606123
CO_2e	-4045.701591

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	SO_x	NO_x	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_2O	CO_2	CO_2e
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

Takeoff [Military] (mins): 9
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)
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? 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: 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	-0.165118
SO_x	-1.472305
NO_x	-14.723053
CO	-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_2O	-0.036161

Pollutant	Emissions Per Year (TONs)
CO_2	-4407.889361
CO_2e	-4423.300407

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

Pollutant	Emissions Per Year (TONs)
VOC	-0.165118
SO_x	-1.472305
NO_x	-14.723053
CO	-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 [LFP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.185345
N_2O	-0.036161

Pollutant	Emissions Per Year (TONs)
CO_2	-4407.889361
CO_2e	-4423.300407

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	SO_x	NO_x	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_2O	CO_2	CO_2e
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: LFP (Low Flight Pattern)
Number of Annual Flight Operation Cycles for 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): 7.38
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)

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:

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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
__X__ 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

2026

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
CO	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 (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.496	250	No
NOx	100.726	250	No
CO	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 (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	22.912	250	No
NOx	234.858	250	No
CO	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 (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	22.912	250	No
NOx	234.858	250	No
CO	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

Name, Title — **Date**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

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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.	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: 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
CO	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_2O	0.000711

Pollutant	Total Emissions (TONs)
CO_2	24.445210
CO_2e	24.679308

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.000886
N_2O	0.000711

Pollutant	Total Emissions (TONs)
CO_2	24.445210
CO_2e	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 (ft^2): 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)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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_2e**
Emission Factors	0.02333	0.00467	575.01338	576.98668
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

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

	VOC	**SO_x**	**NO_x**	**CO**	**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_2O**	**CO_2**	**CO_2e**
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/ft^3)
BA: Area of Building to be demolished (ft^2)
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 (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
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)

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

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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
CO	1.698441

Pollutant	Total Emissions (TONs)
PM 10	0.043521
PM 2.5	0.040030
Pb	0.000000
NH_3	0.004030

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011635
N_2O	0.005871

Pollutant	Total Emissions (TONs)
CO_2	305.990347
CO_2e	308.030442

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011635
N_2O	0.005871

Pollutant	Total Emissions (TONs)
CO_2	305.990347
CO_2e	308.030442

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

3.1.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
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 (%)

	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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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**	**CO**	**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]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
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

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

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 (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
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 (ft^2): 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 (%)

	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)

	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

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

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 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 (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
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: 1
Start 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
CO	2.311038

Pollutant	Total Emissions (TONs)
PM 10	7.179421
PM 2.5	0.059089
Pb	0.000000
NH_3	0.010332

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N_2O	0.021032

Pollutant	Total Emissions (TONs)
CO_2	495.177394
CO_2e	501.859555

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N_2O	0.021032

Pollutant	Total Emissions (TONs)
CO_2	495.177394
CO_2e	501.859555

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
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 (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

4.1.3 Site Grading Phase Emission Factor(s)

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

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**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	**SO_x**	**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 Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.54993	534.37751
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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

4.1.4 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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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

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 Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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	**SO_x**	**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 Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	587.87714	589.89459
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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**	**CO**	**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]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (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 (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
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 (ft^2): 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	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

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

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 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 (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
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 (ft^2): 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	SO_x	NO_x	CO	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	SO_x	NO_x	CO	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	SO_x	NO_x	CO	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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (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)

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

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 (ft^2)
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
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
CO	1.531079

Pollutant	Total Emissions (TONs)
PM 10	0.041748
PM 2.5	0.036288
Pb	0.000000
NH_3	0.007423

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N_2O	0.014805

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO_2e	339.018625

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N_2O	0.014805

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO_2e	339.018625

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
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**	**CO**	**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	**SO_x**	**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	**SO_x**	**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 Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02385	0.00477	587.87714	589.89459
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (yd^3)

$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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 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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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**	**CO**	**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]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
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 (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
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 (ft^2): 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	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

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

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 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 (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
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 (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 (%)

	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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.80405	527.60847
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (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)

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

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 (ft^2)
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
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_2O	0.000651

Pollutant	Total Emissions (TONs)
CO_2	41.087446
CO_2e	41.321134

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.001589
N_2O	0.000651

Pollutant	Total Emissions (TONs)
CO_2	41.087446
CO_2e	41.321134

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
Number 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 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	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**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	**SO_x**	**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)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.54993	534.37751
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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 (ft^2): 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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
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 (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)

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

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 (ft^2)
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: 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
CO	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_2O	0.057484

Pollutant	Emissions Per Year (TONs)
CO_2	7033.550033
CO_2e	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
CO	5.455483

Pollutant	Emissions Per Year (TONs)
PM 10	4.140309
PM 2.5	3.730010
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	0.201346
N_2O	0.039283

Pollutant	Emissions Per Year (TONs)
CO_2	4788.426938
CO_2e	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
CO	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)
CH_4	0.005407
N_2O	0.001055

Pollutant	Emissions Per Year (TONs)
CO_2	128.598895
CO_2e	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
CO	12.271416

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)
CH_4	0.085870
N_2O	0.017146

Pollutant	Emissions Per Year (TONs)
CO_2	2116.524200
CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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: 16
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1600
Number of Annual Trim Test(s) per Aircraft: 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)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

7.4.2 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	CH_4	N_2O	CO_2	CO_2e

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

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

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 AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
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)

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

Designation	Fuel Flow	VOC	SO_x	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	CH_4	N_2O	CO_2	CO_2e
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
CO	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_2O	0.050119

Pollutant	Emissions Per Year (TONs)
CO_2	6109.327408
CO_2e	6130.687092

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

Pollutant	Emissions Per Year (TONs)
VOC	0.061147
SO_x	2.040613
NO_x	17.119035
CO	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 [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.256888
N_2O	0.050119

Pollutant	Emissions Per Year (TONs)
CO_2	6109.327408
CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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 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

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

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
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)
CH_4	0.204553
N_2O	0.040737

Pollutant	Emissions Per Year (TONs)
CO_2	5017.386842
CO_2e	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

Pollutant	Emissions Per Year (TONs)
PM 10	0.185369
PM 2.5	0.167048

NO_x	0.926572	Pb	0.000000
CO	16.679614	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	0.029756	CO_2	707.662376
N_2O	0.005805	CO_2e	710.136535

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.018051	PM 10	0.001659
SO_x	0.003383	PM 2.5	0.001502
NO_x	0.017753	Pb	0.000000
CO	0.075266	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_2O	0.000083	CO_2e	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
CO	26.613404	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_2O	0.034849	CO_2e	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)

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

	Fuel Flow	VOC	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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: 15
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): 1.09
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 per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

9.4.2 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	CH_4	N_2O	CO_2	CO_2e

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

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

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 AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
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)

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

Designation	Fuel Flow	VOC	SO_x	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	CH_4	N_2O	CO_2	CO_2e
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
CO	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_2O	0.000360

Pollutant	Emissions Per Year (TONs)
CO_2	43.920668
CO_2e	44.074225

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

Pollutant	Emissions Per Year (TONs)
VOC	0.023092
SO_x	0.014670
NO_x	0.079348
CO	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 [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001847
N_2O	0.000360

Pollutant	Emissions Per Year (TONs)
CO_2	43.920668
CO_2e	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	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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: 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	3.849865
SO_x	0.016421
NO_x	1.823896
CO	47.728733

Pollutant	Emissions Per Year (TONs)
PM 10	0.063118
PM 2.5	0.055791
Pb	0.000000
NH_3	0.575166

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.181239
N_2O	0.077689

Pollutant	Emissions Per Year (TONs)
CO_2	4900.121232
CO_2e	4927.773503

11.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel:	2119
Civilian Personnel:	37
Support Contractor Personnel:	144
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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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

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): 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

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

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
__X__ not applicable

Conformity Analysis Summary:

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.025		
NOx	11.502		
CO	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		
CO	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		
CO	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
CO	0.000		
SOx	0.000	100	No
PM 10	0.000	100	No
PM 2.5	0.000	100	No
Pb	0.000		

NH3	0.000	100	No
Douglas (Cochise County), AZ			
VOC	0.056		
NOx	25.824		
CO	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 County), AZ			
VOC	0.056		
NOx	25.824		
CO	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		
CO	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		
CO	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		
CO	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		
CO	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	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.025		
NOx	11.505		
CO	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		
CO	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		
CO	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		
CO	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		

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**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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: 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	0.025141
SO_x	1.345019
NO_x	11.501799
CO	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)
CH_4	0.169322
N_2O	0.033035

Pollutant	Emissions Per Year (TONs)
CO_2	4026.811214
CO_2e	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
CO	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)
CH_4	0.169322
N_2O	0.033035

Pollutant	Emissions Per Year (TONs)
CO_2	4026.811214
CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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)	
Number of Annual Flight Operation Cycles for all Aircraft:		451
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):	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
CO	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)
CH_4	0.036042
N_2O	0.007032

Pollutant	Emissions Per Year (TONs)
CO_2	857.148285
CO_2e	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
CO	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)
CH_4	0.036042
N_2O	0.007032

Pollutant	Emissions Per Year (TONs)
CO_2	857.148285
CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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 Aircraft:		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: 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	0.031306
SO_x	1.674862

Pollutant	Emissions Per Year (TONs)
PM 10	2.285326
PM 2.5	2.050532

NO_x	14.322417	Pb	0.000000
CO	3.036666	NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	0.210845	CO_2	5014.317467
N_2O	0.041136	CO_2e	5031.848732

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.031306	PM 10	2.285326
SO_x	1.674862	PM 2.5	2.050532
NO_x	14.322417	Pb	0.000000
CO	3.036666	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_2O	0.041136	CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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:		1053
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):	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):	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

CO	0.002777	NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	0.000061	CO_2	1.453843
N_2O	0.000012	CO_2e	1.458926

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.000277	PM 10	0.000145
SO_x	0.000486	PM 2.5	0.000132
NO_x	0.002991	Pb	0.000000
CO	0.002777	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	0.000061	CO_2	1.453843
N_2O	0.000012	CO_2e	1.458926

5.2 Aircraft & Engines

5.2.1 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:

5.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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)	
Number of Annual Flight Operation Cycles for all Aircraft:		11
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):	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

CO	0.070731

NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001557
N_2O	0.000304

Pollutant	Emissions Per Year (TONs)
CO_2	37.023429
CO_2e	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
CO	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)
CH_4	0.001557
N_2O	0.000304

Pollutant	Emissions Per Year (TONs)
CO_2	37.023429
CO_2e	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	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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:		15
Flight Operation Cycle Type:	LFP (Low Flight 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):	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
CO	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)
CH_4	0.000333
N_2O	0.000065

Pollutant	Emissions Per Year (TONs)
CO_2	7.930052
CO_2e	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
CO	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)
CH_4	0.000333
N_2O	0.000065

Pollutant	Emissions Per Year (TONs)
CO_2	7.930052
CO_2e	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	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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:		15
Flight Operation Cycle Type:	LFP (Low Flight Pattern)	
Number of Annual Flight Operation Cycles for all Aircraft:		60
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):	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: 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	0.008324
SO_x	0.014601

Pollutant	Emissions Per Year (TONs)
PM 10	0.004367
PM 2.5	0.003957

NO_x	0.089928	Pb	0.000000
CO	0.083514	NH_3	0.000000

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
CH_4	0.001838	CO_2	43.714410
N_2O	0.000359	CO_2e	43.867246

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

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.008324	PM 10	0.004367
SO_x	0.014601	PM 2.5	0.003957
NO_x	0.089928	Pb	0.000000
CO	0.083514	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_2O	0.000359	CO_2e	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	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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:		900
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):	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

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

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

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:

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

____ applicable
_X_ 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:

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
CO	-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
CO	-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.

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

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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
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
CO	-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_2O	-0.185538

Pollutant	Emissions Per Year (TONs)
CO_2	-22737.218390
CO_2e	-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_2O	-0.097561

Pollutant	Emissions Per Year (TONs)
CO_2	-11892.335332
CO_2e	-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
CO	-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)
CH_4	-0.004754
N_2O	-0.000928

Pollutant	Emissions Per Year (TONs)
CO_2	-113.068618
CO_2e	-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

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)
CH_4	-0.435194
N_2O	-0.087049

Pollutant	Emissions Per Year (TONs)
CO_2	-10731.814440
CO_2e	-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	SO_x	NO_x	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_2O	CO_2	CO_2e
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

- Flight Operations

Number of Aircraft: 32
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 10320
Number of Annual Trim Test(s) per Aircraft: 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 per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

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	CH_4	N_2O	CO_2	CO_2e

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

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 AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
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)

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

Designation	Fuel Flow	VOC	SO_x	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
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_2O	CO_2	CO_2e
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
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_2O	-0.002455

Pollutant	Emissions Per Year (TONs)
CO_2	-299.206336
CO_2e	-300.252434

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

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 [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.012581
N_2O	-0.002455

Pollutant	Emissions Per Year (TONs)
CO_2	-299.206336
CO_2e	-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	SO_x	NO_x	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_2O	CO_2	CO_2e
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 for all Aircraft: 1714
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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

Pollutant	Emissions Per Year (TONs)
PM 10	-0.027440
PM 2.5	-0.024287
Pb	0.000000
NH_3	-0.254462

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	-0.081841
N_2O	-0.034197

Pollutant	Emissions Per Year (TONs)
CO_2	-2129.716318
CO_2e	-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)

- 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)

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	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

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

	CH_4	N_2O	CO_2	CO_2e
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
CO	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_2O	-0.654022

Pollutant	Emissions Per Year (TONs)
CO_2	-79722.986179
CO_2e	-80001.716995

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

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	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 [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	-3.352236
N_2O	-0.654022

Pollutant	Emissions Per Year (TONs)
CO_2	-79722.986179
CO_2e	-80001.716995

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	SO_x	NO_x	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_2O	CO_2	CO_2e
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 all 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)

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: 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:

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

____ applicable
_X_ 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

2026

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
CO	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 (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	7.496	250	No
NOx	100.726	250	No
CO	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 (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	22.912	250	No
NOx	234.858	250	No
CO	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 (ton/yr)	INSIGNIFICANCE INDICATOR	
		Indicator (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	22.912	250	No
NOx	234.858	250	No
CO	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**

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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
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
CO	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_2O	0.000711

Pollutant	Total Emissions (TONs)
CO_2	24.445210
CO_2e	24.679308

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.000886
N_2O	0.000711

Pollutant	Total Emissions (TONs)
CO_2	24.445210
CO_2e	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 (ft^2): 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)

Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73]						
	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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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_2e**
Emission Factors	0.02333	0.00467	575.01338	576.98668
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02159	0.00432	532.17175	533.99803
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.86270	531.68105

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

	VOC	**SO_x**	**NO_x**	**CO**	**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_2O**	**CO_2**	**CO_2e**
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/ft^3)
BA: Area of Building to be demolished (ft^2)
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 (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
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)

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
CO	1.698441

Pollutant	Total Emissions (TONs)
PM 10	0.043521
PM 2.5	0.040030
Pb	0.000000
NH_3	0.004030

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011635
N_2O	0.005871

Pollutant	Total Emissions (TONs)
CO_2	305.990347
CO_2e	308.030442

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011635
N_2O	0.005871

Pollutant	Total Emissions (TONs)
CO_2	305.990347
CO_2e	308.030442

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

3.1.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
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 (%)

	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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	SO_x	NO_x	CO	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**	**CO**	**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]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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

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

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 (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
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 (ft^2): 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 (%)

	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)

	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

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

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 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 (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
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: 1
Start 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
CO	2.311038

Pollutant	Total Emissions (TONs)
PM 10	7.179421
PM 2.5	0.059089
Pb	0.000000
NH_3	0.010332

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N_2O	0.021032

Pollutant	Total Emissions (TONs)
CO_2	495.177394
CO_2e	501.859555

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.016591
N_2O	0.021032

Pollutant	Total Emissions (TONs)
CO_2	495.177394
CO_2e	501.859555

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
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 (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

4.1.3 Site Grading Phase Emission Factor(s)

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

Excavators Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**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	**SO_x**	**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 Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.54993	534.37751
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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

4.1.4 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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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

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 Composite [HP: 36] [LF: 0.38]						
	VOC	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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	**SO_x**	**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 Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	587.87714	589.89459
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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**	**CO**	**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]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (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 (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
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 (ft^2): 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	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

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

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 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 (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
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 (ft^2): 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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	**N_2O**	**CO_2**	**CO_2e**
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 (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)

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

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 (ft^2)
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

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
CO	1.531079

Pollutant	Total Emissions (TONs)
PM 10	0.041748
PM 2.5	0.036288
Pb	0.000000
NH_3	0.007423

- Activity Emissions of GHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N_2O	0.014805

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO_2e	339.018625

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.011074
N_2O	0.014805

Pollutant	Total Emissions (TONs)
CO_2	334.330148
CO_2e	339.018625

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

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**	**CO**	**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	**SO_x**	**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	**SO_x**	**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 Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02381	0.00476	587.02896	589.04350
Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02385	0.00477	587.87714	589.89459
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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 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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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**	**CO**	**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]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02140	0.00428	527.46069	529.27080
Forklifts Composite [HP: 82] [LF: 0.2]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02138	0.00428	527.09717	528.90603
Generator Sets Composite [HP: 14] [LF: 0.74]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.32694	570.27730
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468
Welders Composite [HP: 46] [LF: 0.45]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02305	0.00461	568.29068	570.24091

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
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 (ft^2): 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	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

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

	CH_4	N_2O	CO_2	CO_2e
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 (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 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 (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
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 (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 (%)

	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	SO_x	NO_x	CO	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	SO_x	NO_x	CO	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	SO_x	NO_x	CO	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	SO_x	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)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02133	0.00427	525.80405	527.60847
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (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)

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

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 (ft^2)
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
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_2O	0.000651

Pollutant	Total Emissions (TONs)
CO_2	41.087446
CO_2e	41.321134

- Global Scale Activity Emissions for SCGHG:

Pollutant	Total Emissions (TONs)
CH_4	0.001589
N_2O	0.000651

Pollutant	Total Emissions (TONs)
CO_2	41.087446
CO_2e	41.321134

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
Number 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 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	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.31292	0.00490	2.52757	3.39734	0.14041	0.12918
Other Construction Equipment Composite [HP: 82] [LF: 0.42]						
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**
Emission Factors	0.28160	0.00487	2.73375	3.50416	0.15811	0.14546
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]						
	VOC	**SO_x**	**NO_x**	**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	**SO_x**	**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)

Graders Composite [HP: 148] [LF: 0.41]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02153	0.00431	530.81500	532.63663
Other Construction Equipment Composite [HP: 82] [LF: 0.42]				

	CH_4	N_2O	CO_2	CO_2e
Emission Factors	0.02140	0.00428	527.54121	529.35159
Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02160	0.00432	532.54993	534.37751
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^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)

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

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 (ft^2): 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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**NO_x**	**CO**	**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	**SO_x**	**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)

Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02313	0.00463	570.16326	572.11992
Pavers Composite [HP: 81] [LF: 0.42]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02133	0.00427	525.80405	527.60847
Paving Equipment Composite [HP: 89] [LF: 0.36]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02141	0.00428	527.70636	529.51732
Rollers Composite [HP: 36] [LF: 0.38]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**

Emission Factors	0.02381	0.00476	586.91372	588.92786
Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]				
	CH_4	**N_2O**	**CO_2**	**CO_2e**
Emission Factors	0.02149	0.00430	529.70686	531.52468

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

	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 Greenhouse Gasses Emission Factors (grams/mile)

	CH_4	N_2O	CO_2	CO_2e
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 (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)

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

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 (ft^2)
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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
CO	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_2O	0.057484

Pollutant	Emissions Per Year (TONs)
CO_2	7033.550033
CO_2e	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
CO	5.455483

Pollutant	Emissions Per Year (TONs)
PM 10	4.140309
PM 2.5	3.730010
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	0.201346
N_2O	0.039283

Pollutant	Emissions Per Year (TONs)
CO_2	4788.426938
CO_2e	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
CO	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)
CH_4	0.005407
N_2O	0.001055

Pollutant	Emissions Per Year (TONs)
CO_2	128.598895
CO_2e	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
CO	12.271416

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)
CH_4	0.085870
N_2O	0.017146

Pollutant	Emissions Per Year (TONs)
CO_2	2116.524200
CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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: 16
Flight Operation Cycle Type: LTO (Landing and Takeoff)
Number of Annual Flight Operation Cycles for all Aircraft: 1600
Number of Annual Trim Test(s) per Aircraft: 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)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

7.4.2 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	CH_4	N_2O	CO_2	CO_2e

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

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 AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
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)

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

Designation	Fuel Flow	VOC	SO_x	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	CH_4	N_2O	CO_2	CO_2e
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
CO	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_2O	0.050119

Pollutant	Emissions Per Year (TONs)
CO_2	6109.327408
CO_2e	6130.687092

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

Pollutant	Emissions Per Year (TONs)
VOC	0.061147
SO_x	2.040613
NO_x	17.119035
CO	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 [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.256888
N_2O	0.050119

Pollutant	Emissions Per Year (TONs)
CO_2	6109.327408
CO_2e	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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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 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
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

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.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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)
CH_4	0.204553
N_2O	0.040737

Pollutant	Emissions Per Year (TONs)
CO_2	5017.386842
CO_2e	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
CO	16.679614

Pollutant	Emissions Per Year (TONs)
PM 10	0.185369
PM 2.5	0.167048
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_2O	0.005805

Pollutant	Emissions Per Year (TONs)
CO_2	707.662376
CO_2e	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
CO	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)
CH_4	0.000426
N_2O	0.000083

Pollutant	Emissions Per Year (TONs)
CO_2	10.127091
CO_2e	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
CO	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)
CH_4	0.174371
N_2O	0.034849

Pollutant	Emissions Per Year (TONs)
CO_2	4299.597375
CO_2e	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)

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

	Fuel Flow	VOC	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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: 15
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): 1.09
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 per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

9.4.2 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	CH_4	N_2O	CO_2	CO_2e

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

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 AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
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)

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

Designation	Fuel Flow	VOC	SO_x	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	CH_4	N_2O	CO_2	CO_2e
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
CO	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_2O	0.000360

Pollutant	Emissions Per Year (TONs)
CO_2	43.920668
CO_2e	44.074225

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

Pollutant	Emissions Per Year (TONs)
VOC	0.023092
SO_x	0.014670
NO_x	0.079348
CO	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 [CP Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.001847
N_2O	0.000360

Pollutant	Emissions Per Year (TONs)
CO_2	43.920668
CO_2e	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	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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: 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	3.849865
SO_x	0.016421
NO_x	1.823896
CO	47.728733

Pollutant	Emissions Per Year (TONs)
PM 10	0.063118
PM 2.5	0.055791
Pb	0.000000
NH_3	0.575166

- Global Scale Activity Emissions of Greenhouse Gasses:

Pollutant	Emissions Per Year (TONs)
CH_4	0.181239
N_2O	0.077689

Pollutant	Emissions Per Year (TONs)
CO_2	4900.121232
CO_2e	4927.773503

11.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 2119
Civilian Personnel: 37
Support Contractor Personnel: 144
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	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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
CO	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	1.126308
N_2O	0.219743

Pollutant	Emissions Per Year (TONs)
CO_2	26785.883904
CO_2e	26879.533824

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

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	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 [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	1.126308
N_2O	0.219743

Pollutant	Emissions Per Year (TONs)
CO_2	26785.883904
CO_2e	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)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	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_2O	CO_2	CO_2e
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: 14
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 1600
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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- 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

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
CO	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_2O	0.036594

Pollutant	Emissions Per Year (TONs)
CO_2	4460.654054
CO_2e	4476.249578

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

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	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 [DC Flight Operations part]:

Pollutant	Emissions Per Year (TONs)
CH_4	0.187564
N_2O	0.036594

Pollutant	Emissions Per Year (TONs)
CO_2	4460.654054
CO_2e	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

- 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)

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

	Fuel Flow	VOC	SO_x	NO_x	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	CH_4	N_2O	CO_2	CO_2e
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

- Flight Operations

Number of Aircraft: 15
Flight Operation Cycle Type: DC (Destination Cycle)
Number of Annual Flight Operation Cycles for all Aircraft: 3000
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

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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.

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, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory 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).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

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

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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
2032	90,756,232	249,199	22,164	91,027,596
2033	90,756,232	249,199	22,164	91,027,596
2034	90,756,232	249,199	22,164	91,027,596
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
2029	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2033	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2034	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2035	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2036	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2037	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2038	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2039	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2040	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2041	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2042	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2043	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2044	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2045	5,136,454,179	25,626,912	1,500,708	5,163,581,798
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

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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 Totals		-0.10484552%	-0.00159692%	-0.00358634%	-0.10490252%
Percent of U.S. Totals		-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 — Aug 02 2024

Name, Title — **Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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.

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 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.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory 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).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

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
2032	49,306	2.04209413	0.43792166	49,488	68,039	No
2033	49,306	2.04209413	0.43792166	49,488	68,039	No
2034	49,306	2.04209413	0.43792166	49,488	68,039	No
2035	49,306	2.04209413	0.43792166	49,488	68,039	No
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

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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**
2025	90,756,232	249,199	22,164	91,027,596
2026	90,756,232	249,199	22,164	91,027,596
2027	90,756,232	249,199	22,164	91,027,596
2028	90,756,232	249,199	22,164	91,027,596
2029 [SS Year]	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
2032	90,756,232	249,199	22,164	91,027,596
2033	90,756,232	249,199	22,164	91,027,596
2034	90,756,232	249,199	22,164	91,027,596
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
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
2027	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
2029 [SS Year]	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2033	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2034	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2035	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2036	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2037	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2038	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2039	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2040	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2041	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2042	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2043	5,136,454,179	25,626,912	1,500,708	5,163,581,798

2044	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2045	5,136,454,179	25,626,912	1,500,708	5,163,581,798
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
2048	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2049	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**
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.2. AFSOC Annual Ordnances

	Usage	Units
2.75-inch Rocket	315	EA
Defensive Chaff	6,000	EA
Flares	4,020	EA

Table 1-G.3. Ordnance Combustive Emission Factors -

Ordnance Type	*Pounds per Item*					
	VOC	*CO*	*NOx*	SO_2	PM_{10}	$PM_{2.5}$
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.4. A-10 Ordnance Combustive Emissions -

Ordnance Type	*Annual Emissions (Pounds/Year)*					
	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	*Annual Emissions (Pounds/Year)*					
	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

Davis Monthan A-10A TIMs Summary					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
LTO Flight	0.00	0.00	1.25	0.96	5.46
LTO Taxi	26.33	0.00	0.00	0.00	0.00
Total LTO	26.33	0.00	1.25	0.96	5.46
Closed Patterns	0.00	0.00	0.48	0.96	1.66

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 Flight Operations Cycles that are outdated and unverifiable; the U.S. Air Force believes the noise profile data is currently the best

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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.

A-10A TIMs Summary - Fuzzy					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	21.00	9.00	0.00

A-10A TIMs Summary - Jackal Low					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	20.36	5.36	0.00

A-10A TIMs Summary - Tombstone A					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	9.00	0.00	0.00

A-10A TIMs Summary - Tombstone B					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	9.00	0.00	0.00

A-10A TIMs Summary - R-2301E (BMGR)					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	7.38	0.00	0.00

Methodology and Scientific Integrity

Methodology:

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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.

EMISSIONS ESTIMATES FOR MUNITIONS USAGE

A-10A TIMs Summary GHG emissions					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Destination Cycle (DC)	0.00	0.00	48.36	29.64	0.00

Methodology and Scientific Integrity

Methodology:

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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 TIMs Summary					
	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
Closed Patterns	0.00	0.00	0.53	3.62	4.17

Methodology and Scientific Integrity

Methodology:

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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 TIMs Summary - Tombstone A					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	48.00	0.00

C-130J TIMs Summary - Tombstone B					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	48.00	0.00

C-130J TIMs Summary - R-2301E (BMGR)					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	48.00	0.00

C-130J TIMs Summary - R-2303A (Fort Huachuca)					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	25.60	0.00

Methodology and Scientific Integrity

Methodology:

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C-130J TIMs Summary GHG emissions					
	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

Methodology and Scientific Integrity

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OA-1KTIMs Summary					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
LTO Flight	0.00	0.00	1.09	1.35	7.31
LTO Taxi	21.55	0.00	0.00	0.00	0.00
Total LTO	21.55	0.00	1.09	1.35	7.31
Closed Patterns	0.00	0.00	0.43	4.74	6.20

Methodology and Scientific Integrity

Methodology:

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OA-1K TIMs Summary - Jackal Low					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	8.00	0.00

OA-1K TIMs Summary - Tombstone A					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	7.47	0.00

OA-1K TIMs Summary - Tombstone B					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	7.47	0.00

OA-1K TIMs Summary - R-2301E (BMGR)					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	8.00	0.00

OA-1K TIMs Summary - R-2303A (Fort Huachuca)					
	Idle In/Out (min)	Takeoff AB (min)	Takeoff Mil (min)	Climbout (min)	Approach (min)
Low Flight Pattern (LFP)	0.00	0.00	0.00	2.94	0.00

Methodology and Scientific Integrity

Methodology:

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OA-1K TIMs Summary GHG emissions					
	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

Methodology and Scientific Integrity
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