Draft

Environmental Assessment for

F-16 Mission Conversion

122D Fighter Wing
Fort Wayne Air National Guard Base
Fort Wayne, Indiana

December 2021

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Cover graphic: F-16 Fighter jets assigned to the 122d Fighter Wing, Fort Wayne, Indiana, and the 127th Fighter Wing, Selfridge, Michigan, in formation after a routine refueling (122 FW, 2009).

Privacy Advisory

This Draft Environmental Assessment is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] 1500–1508), and 32 CFR 989, Environmental Impact Analysis Process (EIAP).

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

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 Personal home addresses and phone numbers will not be published in the Final EA.

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Acronyms and Abbreviations

122 FW	122d Fighter Wing
ACAM	Air Conformity Applicability Model
AFI	Air Force Instruction
AGE	aerospace ground equipment
AGL	above ground level
AI	Air Interdiction
ANG	Air National Guard
ANGB	Air National Guard Base
APE	Area of Potential Effect
ARTCC	Air Route Traffic Control Center
AST	aboveground storage tank
AT/FP	antiterrorism/force protection
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
BASH	Bird/Wildlife Aircraft Strike Hazard
CAS	Close Air Support
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRTC	Combat Readiness Training Center
CT	Census Tract
dB	decibels
dBA	A-weighted decibels
DAF	Department of the Air Force
DOD	Department of Defense
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	Explosive-Safety Quantity-Distance
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWA	Fort Wayne International Airport
GHG	greenhouse gas
H.R.	House Resolution
HEF	High-Expansion Foam
IFR	Instrument Flight Rules
JPG	Jefferson Proving Ground
IAC	Indiana Administrative Code
IDEM	Indiana Department of Environmental Management
IPaC	Information for Planning and Consultation
LATN	low-altitude tactical navigation
Ldnmr	Onset-Adjusted Monthly Day-Night Average Sound Level
Lmax	Maximum Sound Level
LOA	Letter of Agreement
LPk	peak pressure level
MBTA	Migratory Bird Treaty Act
MOA	Military Operations Area
MSL	mean sea level
MX	maintenance
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NOTAM	Notice to Airmen
NRHP	National Register of Historic Places
OCA	Offensive Counterair
OEPA	Ohio Environmental Protection Agency
OHWM	ordinary high water mark
PAA	Primary Aircraft Authorization
PFAS	per- and polyfluoroalkyl substances
POL	petroleum, oils, and lubricants
PM_{10}	particulate matter equal to or less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 micrometers in diameter
PSD	Prevention of Significant Deterioration
R-	Restricted
RA	Restricted Area
RONA	Record of Non-Applicability
RPZ	runway protection zone
SHPO	State Historic Preservation Office
SPRP	Spill Prevention and Response Plan
SUA	Special Use Airspace
tpy	tons per year
UFC	Unified Facility Criteria
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VFR	Visual Flight Rules

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CHAPTER 1. INTRODUCTION

1.1 BACKGROUND

The National Guard Bureau (NGB) and the Indiana Air National Guard (ANG) are preparing an Environmental Assessment (EA) to consider the potential consequences to the human and natural environment associated with the proposed aircraft mission conversion from A-10 Thunderbolt II aircraft to F-16 Fighting Falcon aircraft, and the related changes in infrastructure to accommodate the new F-16 mission. Under the Proposed Action, Fort Wayne Air National Guard Base (ANGB) would phase out and replace all 21 A-10 mission aircraft with one fighter squadron of 24 F-16 aircraft, or Primary Aircraft Authorization (PAA). This would include minimal operational changes at the airfield and operational changes within existing Special Use Airspace (SUA); an increase of approximately 100 personnel; and the construction and structural improvement projects necessary to facilitate the full mission conversion requirements. The F-16 mission would utilize existing operations and training airspace, but the frequency of training at specific airspaces would change to accommodate F-16 training requirements. The mission transition is planned for Fiscal Year (FY) 2023.

NGB is the proponent of this proposal and the lead agency for preparation of the EA, and the Federal Aviation Administration (FAA) is a cooperating agency.

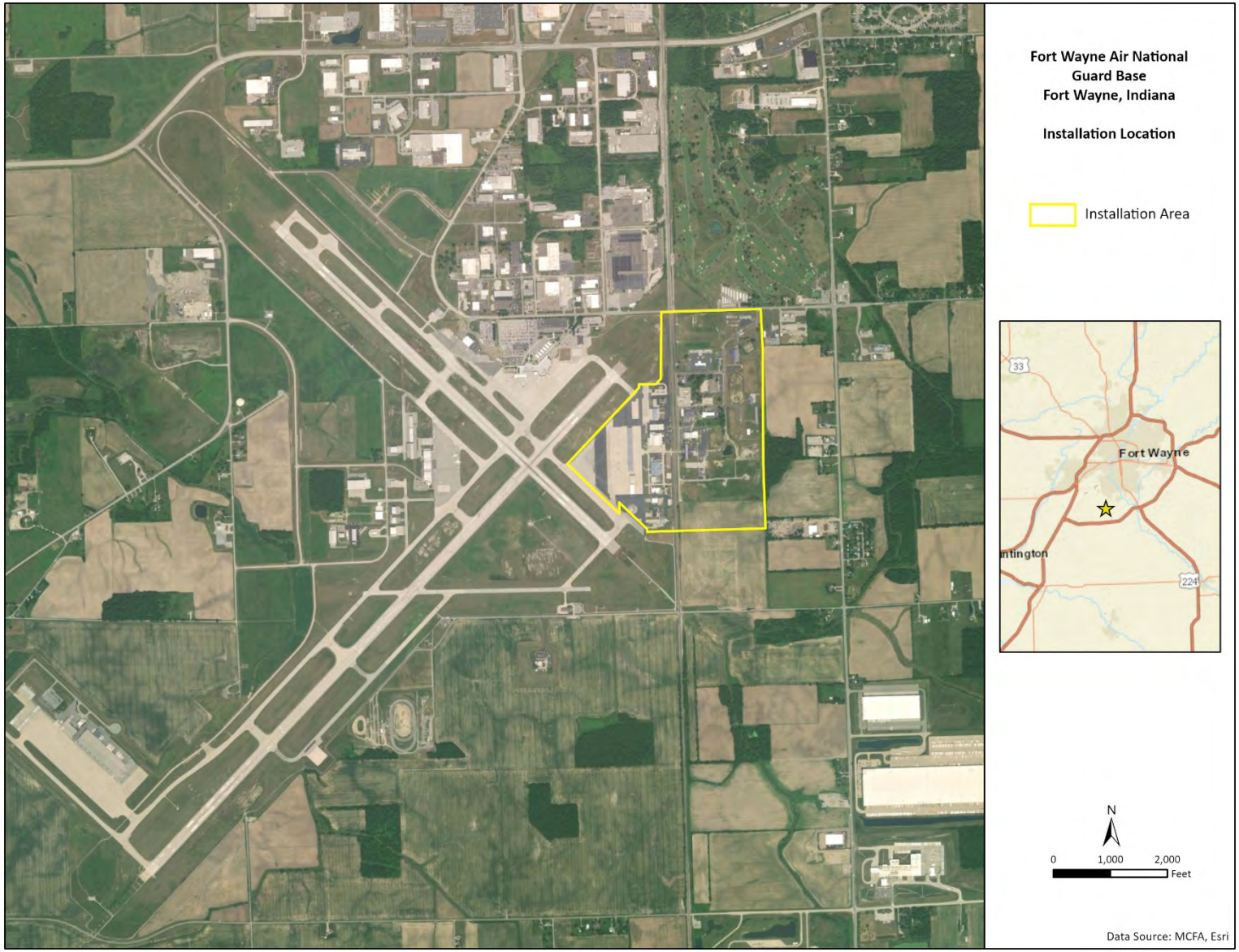
NGB is preparing this EA in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 CFR 4321–4347), as implemented by the CEQ regulations (40 CFR 1500–1508, as revised 2020), the Department of the Air Force's (DAF) Environmental Impact Analysis Process (EIAP; 32 CFR 989), Air Force Instruction (AFI) 32-1015, and FAA's Environmental Impacts: Policies and Procedures (FAA Order 1050.1F). The EA will inform decision makers of the potential consequences of implementing the Proposed Action and the No Action Alternative.

1.2 LOCATION AND HISTORY

The 122d Fighter Wing (122 FW), Indiana ANG, is assigned to Fort Wayne ANGB, located adjacent to the Fort Wayne International Airport (FWA) and approximately three miles south of downtown Fort Wayne, Indiana (see Figure 1-1). The 122 FW occupies approximately 190 acres of leased land in the eastern portion of the airport. The installation is bisected by the Norfolk Southern Railroad, with the installation's operational functions to the west of the railroad and supporting functions to the east. The installation property is leased by the U.S. Air Force from the Fort Wayne Airport Authority, and then licensed back to the state for use by the Indiana Air National Guard (INANG). The current lease will expire in 2085.

In 1991, Fort Wayne ANGB was assigned F-16 aircraft, which were flown at the installation for 20 years until they were replaced with the current A-10 aircraft in 2011.

Figure 1-1 Location of Fort Wayne Air National Guard Base, Fort Wayne, Indiana



1.3 CURRENT MISSION AND OPERATIONS

The 122 FW comprises the "Blacksnakes;" its mission is to deliver decisive firepower and agile combat support to combatant commanders around the globe and full-spectrum response in support of domestic operations. The unit also aids the State of Indiana at the direction of the Governor during local and statewide disasters or emergencies to protect life and property and preserve peace and public safety.

The 122 FW employs 379 full-time personnel and 685 Guardsmen, totaling 1,064 personnel. A unit training drill is typically conducted one weekend per month, where approximately 984 personnel participate. Flying days typically occur four days per week, and a total of 18 flying days per month. There is no housing on Fort Wayne ANGB; personnel live off-base.

The 122 FW maintains and operates 21 A-10 aircraft. The A-10 is a single-seat, twin-engine, straight-wing jet aircraft designed exclusively for close air support. Aircraft operations occur Monday through Friday and one weekend per month. Night training occurs once a month, Monday through Thursday, beginning around sunset and ending approximately three hours after sunset.

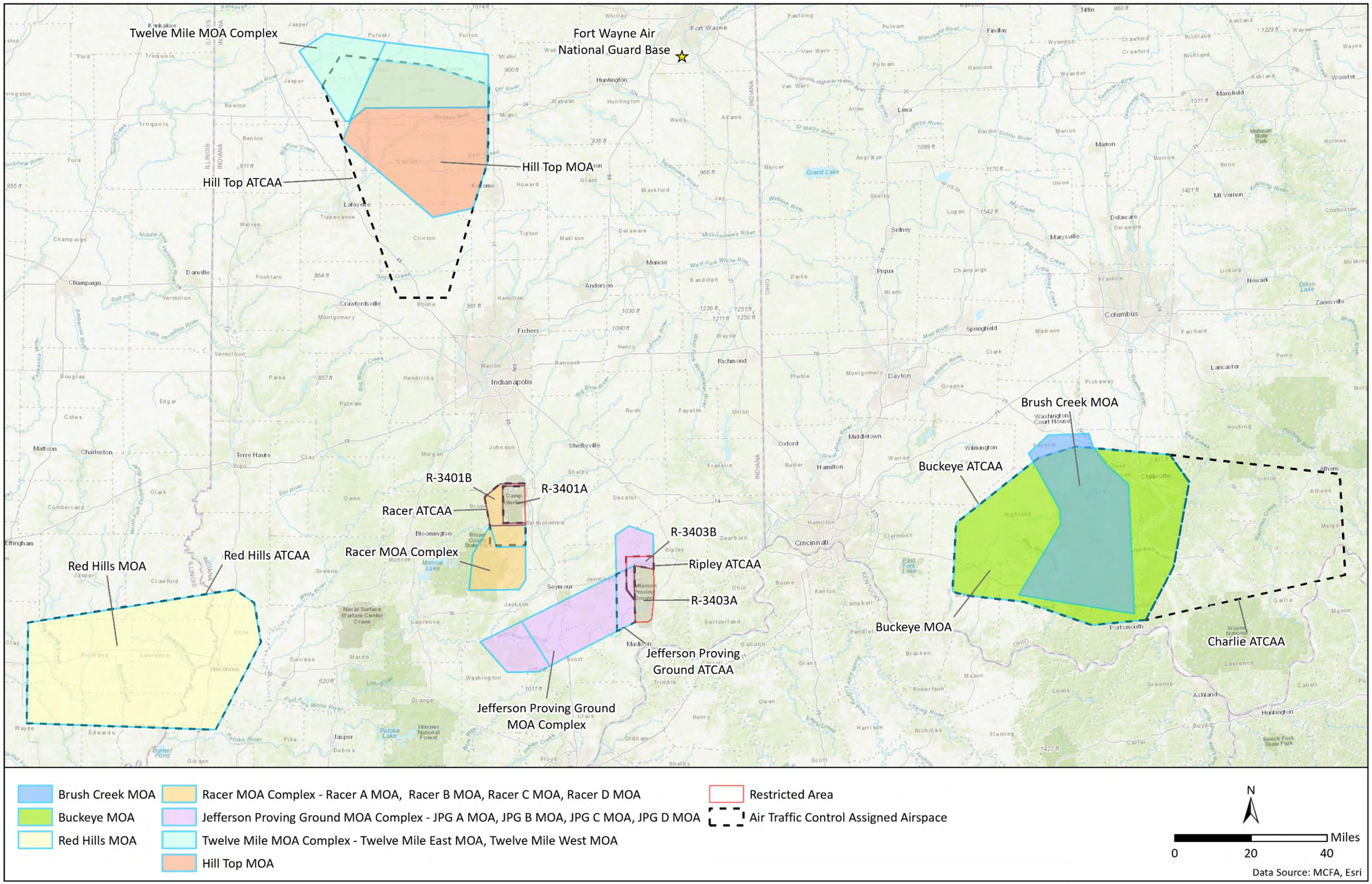
Military training involving the 122 FW A-10 occurs primarily within Special Use Airspace (SUA) located in Indiana, Ohio, and Illinois (shown on Figure 1-2; see also airspace definitions inset on page 5). The 122 FW operates within Restricted Areas (RAs), Military Operations Areas (MOAs), and Air Traffic Control Assigned Areas (ATCAAs), which are listed below:

- Twelve Mile/Hill Top SUA (Twelve Mile East MOA, Twelve Mile West MOA, Hill Top MOA, Hill Top ATCAA)
- Jefferson Proving Ground (JPG) SUA (R-3403A, R-3403B, JPG A MOA, JPG B MOA, JPG C MOA, JPG D MOA, JPG ATCAA, Ripley ATCAA)
- Camp Atterbury (R-3401A, R-3401B) and Racer SUA (Racer A MOA, Racer B MOA, Racer C MOA, Racer D MOA, Racer ATCAA)
- Buckeye/Brush Creek SUA (Buckeye MOA, Brush Creek MOA, Buckeye ATCAA) and Charlie ATCAA
- Red Hills SUA (Red Hills MOA, Red Hills ATCAA)

The 122 FW primarily uses the Twelve Mile/Hill Top SUAs and the JPG SUAs. A-10 mission operations include weapon systems training activities within RAs, and the Fort Wayne ANGB A-10 aircraft carry inert weapons for training activities. Inert munitions training activities are conducted in RAs at ranges associated with Camp Atterbury Joint Maneuver Training Center and JPG. Munitions maintenance training is conducted at 122 FW facilities at Fort Wayne ANGB.

The 122 FW A-10 aircraft use a low-altitude tactical navigation (LATN) area that encompasses the state of Indiana, part of western Ohio, and part of southern Michigan. LATN areas are located outside MOAs and used by low-altitude training aircraft, such as the A-10, which can safely operate at speeds of 250 knots or less. LATN areas are established for occasional visual flight rules, low altitude navigation training. Aircraft in LATNs do not fly over the same point more than once per day, and coordination with the FAA is not required (DAF, 2006).

Figure 1-2 Location of Special Use Airspace Used by the 122d Fighter Wing



Airspace Definitions Used in this Environmental Assessment

Special Use Airspace—SUA—consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. The types of SUA are **Military Operations Areas (MOAs)**, **Restricted Areas (RAs)**, warning areas, prohibited areas, alert areas, controlled firing areas, and national security areas. Most training missions are flown in SUA. This project involves MOAs and RAs.

Military Operations Areas—MOAs—are defined airspace areas established below 17,999 feet above mean sea level to segregate high-performance military aircraft conducting training activities from nonparticipating civil and military air traffic operating under Instrument Flight Rules. Nonparticipating military and civilian aircraft flying under Visual Flight Rules can operate in MOAs without approval from the military scheduling or controlling agency; however, extreme caution is advised when such aircraft transit active MOAs to ensure flight safety. MOAs may lie over large areas of land that are not owned or controlled by the Department of Defense.

Instrument Flight Rules—IFR—govern the procedures for conducting flight under instrument meteorological conditions.

Visual Flight Rules—VFR—govern the procedures for conducting flights under visual conditions.

Restricted Areas—RAs—typically overlie gunnery ranges. Nonparticipating aircraft are restricted from entering these areas because the activities taking place within them are considered hazardous to flight, for example, ordnance delivery or use of non-eye-safe lasers.

Air Traffic Control Assigned Areas—ATCAAs—are defined airspace areas, normally inside Class A airspace, assigned by Air Traffic Control to provide segregation between training activities conducted within the assigned airspace and nonparticipating Instrument Flight Rules traffic. ATCAA altitudes are described in terms of Flight Level starting at 18,000 feet mean sea level, which is termed FL180. ATCAAs are not shown on aeronautical charts; nonparticipating aircraft are separated from the military activity being conducted by Air Traffic Control. In most cases, ATCAAs are located directly above the associated MOA.

1.4 PURPOSE AND NEED

The purpose of the Proposed Action is to facilitate an aircraft conversion at the 122 FW from A-10 aircraft to F-16 aircraft. The action is needed to accommodate a 122 FW mission transition from an A-10 unit to an F-16 unit, as permitted by Section 134, part (f) Special Rule of the National Defense Authorization Act FY17, House Resolution (H.R.) 4909 (Report No. 114-537, Public Law 114-328). The Proposed Action is also needed to support the primary federal mission of the 122 FW, which is to achieve and maintain the level of operational readiness that will provide trained and equipped combat-ready tactical units, capable of global

National Defense Authorization Act FY17
H.R. 4909, Section 134, Prohibition on Availability of Funds for Retirement of A-10 Aircraft

(f) Special Rule.

(1) . . . the Secretary of the Air Force may carry out the transition of the A-10 unit at Fort Wayne Air National Guard Base, Indiana, to an F-16 unit as described by the Secretary in the Force Structure Actions map submitted in support of the budget of the President for fiscal year 2017 (as submitted to Congress under section 1105(a) of title 31, United States Code).

Report No. 114-537, Public Law 114-328, December 23, 2016

(114th Congress, 2016)

deployment, ready for immediate integration into the active Air Force to assure air offense, air defense, or joint action with ground forces.

Although F-16s were previously stationed at Fort Wayne ANGB, construction and renovation is needed to accommodate the aircraft returning to the installation. When the 122 FW transitioned to the A-10 in 2011, facilities including the aircraft arresting system were removed or reconfigured to meet A-10 requirements. Safety and security standards have increased since the 2011 aircraft change, as well as Department of Defense (DOD) Unified Facilities Criteria (UFC) standards and regulations, and facilities at Fort Wayne ANGB need to be brought up to date. To provide the 122 FW with properly sized and configured facilities that meet the requirements of the proposed F-16 mission, some construction, demolition, and renovation projects are needed on the installation. These projects are designed to meet the current design criteria and mission requirements of the F-16 aircraft.

1.5 SUMMARY OF ENVIRONMENTAL STUDY REQUIREMENTS

1.5.1 National Environmental Policy Act (NEPA)

NEPA (42 United States Code [USC] 4321 et seq.) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before action is taken. The CEQ, established under NEPA, is charged with developing and implementing regulations and ensuring federal agency compliance with NEPA. The process for implementing NEPA is codified in Title 40 CFR Parts 1500–1508, revised 2020, *Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act*. These regulations specify that an EA be prepared to satisfy the following:

1) briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)
2) aid in an agency's compliance with NEPA when no EIS is necessary
3) facilitate preparation of an EIS when one is required

The Environmental Impact Analysis Process (EIAP) is the DAF implementing regulations for conducting environmental analyses, as promulgated at 32 CFR 989. To comply with NEPA, CEQ regulations and the EIAP are used together. NGB is the decision maker in this EA, but the FAA has final authority to approve or deny any proposal to alter airspace times of designation. Therefore, the EA must also be consistent with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures.*

The full suite of applicable environmental laws, regulations, and executive orders is included in Appendix A.

1.5.2 Interagency and Intergovernmental Coordination for Environmental Planning

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) is a process used to implement scoping and interagency review requirements. Through the IICEP process, NGB notified relevant federal, state, and local agencies, and federally recognized tribes by letters mailed June 4, 2021, and provided at least 30 days to identify any potential environmental concerns regarding the specific Proposed Action. Consultation letters will be sent to federally recognized tribes in Indiana to initiate government-to-government consultation in accordance with Section 106 of the

National Historic Preservation Act (NHPA). Consultation with U.S. Fish and Wildlife Service (USFWS) was conducted using their online Information for Planning and Consultation (IPaC) tool. Relevant federal, state, and local agencies will be notified of the availability of the Draft EA to review and provide comment on the analyses. IICEP coordination materials are included in Appendix B.

The Draft EA is available electronically (https://www.122fw.ang.af.mil/) and distributed upon request to federal, state, and local agencies and other interested parties, as well as regional libraries to invite public participation. Draft EA review materials will be included in Appendix C following the review period.

Following the 30-day public review and comment period, the NGB will consider the comments received by agencies and the public and revise the EA if warranted. If the NGB determines that the Proposed Action would not have significant environmental impacts, a FONSI will be issued and the action will be implemented. If the NGB determines that the environmental impacts of the Proposed Action would be significant, an EIS will be prepared.

1.6 Resources Carried Forward for Detailed Analysis

After preliminary analyses of potential resource issues, as prescribed by FAA Order 1050.1F and other NGB pre-EIAP (often called "PREIAP") requirements, the following resource areas will be carried forward for further analysis in this EA due to the potential for reasonably foreseeable effects: safety/aircraft safety; airspace management; air quality; climate change; noise and noise compatible land use; water resources; biological resources; historical properties; and hazardous materials, solid waste, and pollution prevention.

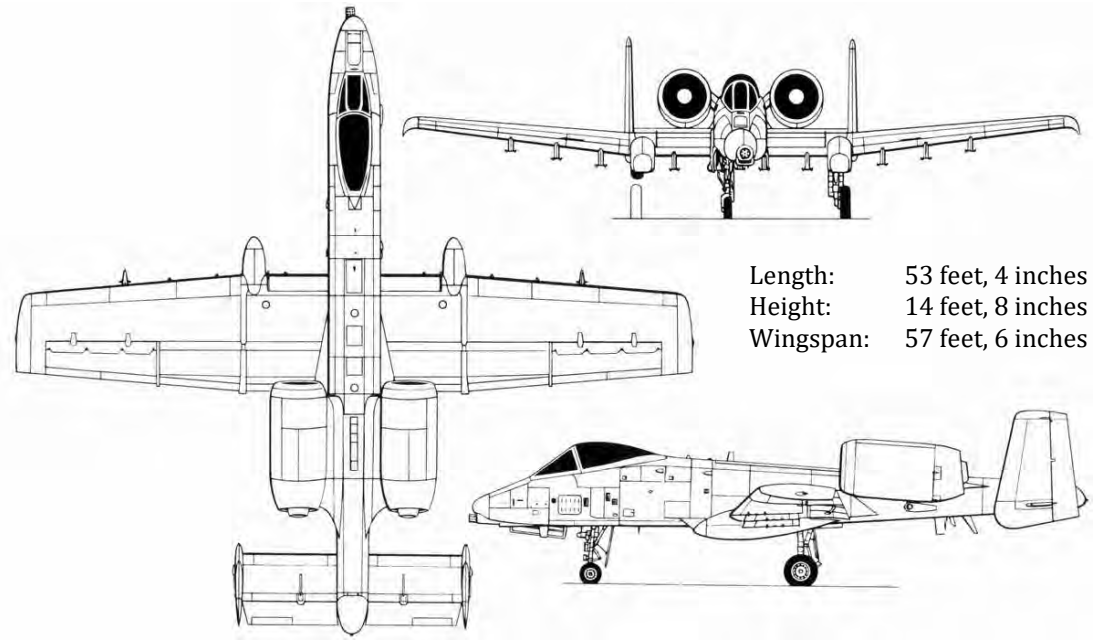
As this is a streamlined EA consistent with CEQ's regulations (40 CFR 1501.5(f)), information about how resources were initially considered and supporting documentation for why resources were eliminated from detailed evaluation are also in Appendix A.

CHAPTER 2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action (Alternative A)

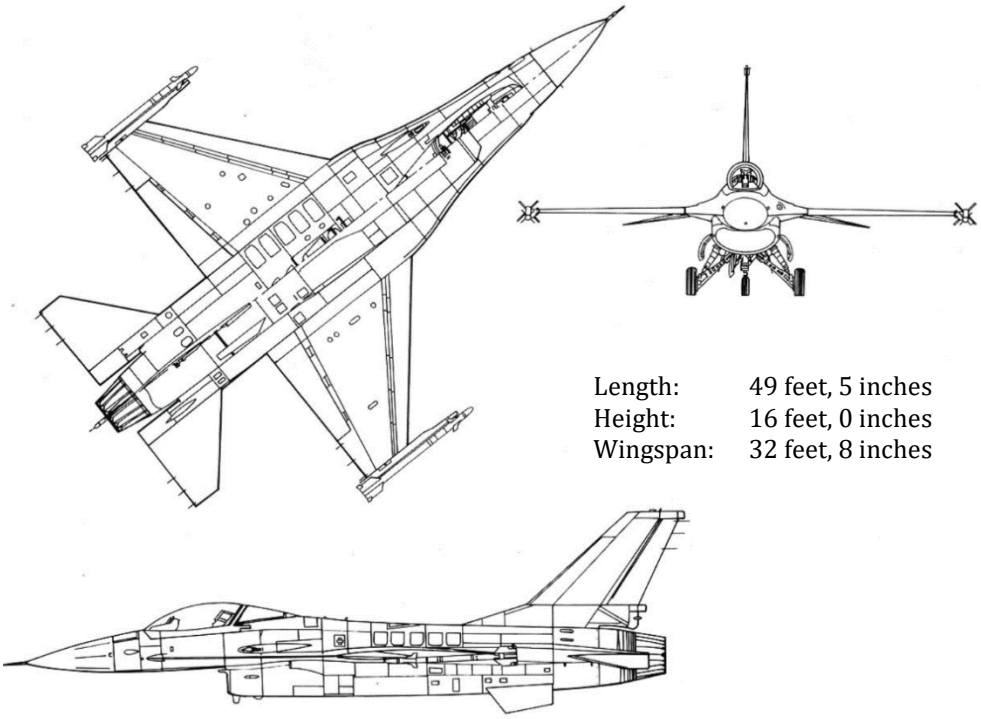
NGB proposes the full replacement of the 21 A-10 mission aircraft at Fort Wayne ANGB with one F-16 fighter squadron of 24 PAA. Figure 2-1 shows a comparison between the A-10 and the F-16. The Proposed Action, described in detail on pages 9 through 16, also includes an estimated increase of 368 annual operations at the airfield (Table 2-1), minor operational changes within existing SUAs (Table 2-2), an increase of approximately 100 personnel (page 11 for further details), and several construction and/or renovation projects (Table 2-4). Implementation of the Proposed Action is the Preferred Alternative.

Figure 2-1 Comparison Between Existing A-10 and Proposed F-16 Aircraft



Length: 53 feet, 4 inches
Height: 14 feet, 8 inches
Wingspan: 57 feet, 6 inches

General Specifications of the A-10



Length: 49 feet, 5 inches
Height: 16 feet, 0 inches
Wingspan: 32 feet, 8 inches

General Specifications of the F-16 C/D

(DAF, 2020a; DAF, 2020b)

F-16 Aircraft

It is anticipated that the F-16 mission would utilize the existing operations and training airspace, including RAs, MOAs, and ATCAAs. In 2011, the 122 FW transitioned from the F-16 to the A-10 aircraft. The current aircraft instrument approaches were established when the F-16s were at the installation previously; as a result, these flight procedures are not expected to change. The F-16 mission would return to the 122 FW with the understanding that F-16 training and tactics, techniques, and procedures have evolved since 2011. Like the A-10 aircraft, the proposed F-16 aircraft would train using inert weapons.

The 122 FW currently conducts approximately 4,032 annual operations out of the FWA with the A-10 aircraft. Under the Proposed Action, annual operations are expected to increase to approximately 4,400 operations with the F-16 aircraft, as shown in Table 2-1. The increase in airfield operations is the result of an increase in visual pattern work that the F-16 mission requires, including the simulated flameout approaches. Since the F-16 is a single-engine aircraft, pilots must be proficient in maneuvering the aircraft to a point above the airfield where they can safely descend to a landing after an engine loss. Simulated flameout approaches are flown with the engine operating but with the throttle decreased to idle thrust. These operations would be performed in close coordination with the FWA Air Traffic Control (ATC) and terminal radar approach control. In addition to the 122 FW operations, there are approximately 33,600 civilian and transient aircraft operations annually at the FWA, which is expected to continue at current levels in the future.

A **sortie** begins on takeoff and ends with a full-stop landing. Between these two events, an aircraft can be flown to a designated airspace supporting mission-specific training requirements or conduct training at the airfield.

An **airfield operation** entails any takeoff or landing event occurring at the airfield, measured as two distinct operation events.

Table 2-1 Existing and Proposed Annual Airfield Operations

Aircraft	Annual Operations
A-10/Current	4,032
F-16/Proposed	4,400

The airspace scheduled and used by the F-16 would be the same airspace that supports A-10 training. Currently, approximately 73 percent of the missions conducted by the A-10 aircraft in the SUA used by the 122 FW include Close Air Support (CAS) and Offensive Counterair (OCA)/Air Interdiction (AI) training. The CAS mission is conducted in close proximity to friendly forces and provides quick action support against enemy ground forces. The A-10 conducts CAS training mainly between 6,000 to 15,000 feet above mean sea level (MSL). The OCA mission includes attacks on air bases; AI can target enemy surface forces such as roads or supply depots. Generally, the A-10 conducts their training for these missions between 500 feet above ground level (AGL) to 15,000 feet MSL.

For the proposed F-16 aircraft, approximately 65 percent of the training in the SUAs would include OCA/AI and CAS, as well as Defensive Counter Air, which consists of defensive measures to detect and identify enemy forces attempting to penetrate the air environment, and Surface Attack Tactics. Most of the training with the F-16 aircraft is conducted between 10,000 to 30,000 feet MSL, which is higher than the altitude where most of the A-10 training is conducted. The F-16 conducts primarily high-altitude training and would infrequently use the LATN currently used by the A-10.

The number of estimated existing and proposed sorties and the annual hours within the RAs and MOAs are shown in Table 2-2 and Appendix D. This includes the existing A-10 aircraft flown by the 122 FW and the F-16 aircraft proposed under the Proposed Action, as well as other aircraft that utilize the airspace. Use of the JPG MOAs and R-3403 would decrease under the F-16 mission and use of the Red Hills MOA would be rare. The F-16s would increase their training in the Buckeye/Brush Creek MOAs because the F-16 mission requires supersonic flight training, which is not an A-10 capability. Supersonic flights are approved in the Buckeye ATCAA over 30,000 feet MSL and F-16s currently conduct this training there. Occasionally, the 122 FW utilizes airspace outside of these SUAs, such as the Pike and Steelhead MOAs in Michigan. The analysis in this EA will focus on the SUA most frequently used by the A-10 mission and proposed under the F-16 mission.

Table 2-2 Existing and Proposed Annual Sorties and Hours in SUAs Used by the 122d Fighter Wing

Airspace	Existing		Proposed	
	Sorties	Time (Hours)	Sorties	Time (Hours)
Twelve Mile/Hill Top MOAs	883	903	890	729
Jefferson Proving Ground MOAs/R-3403	772	632	421	401
Racer MOAs/R-3401	190	210	190	203
Buckeye/Brush Creek MOAs	340	312	1,034	713
Red Hills MOA	16	10	0	0

Note: Detailed operations are shown in Appendix D.
Key: MOA = Military Operations Area; R- = Restricted.

ATCAAs would be used more with the F-16 aircraft than the A-10 since the F-16 has an operational mission altitude envelope that is higher than the A-10. Cruise altitudes from Fort Wayne ANGB to training airspace would also be higher for the F-16s, typically in the flight level ranges from 20,000 to 26,000 feet MSL.

Chaff and flare are currently being used by 122 FW and would continue to be used under the Proposed Action. Approximately 75 percent of all chaff and flare expenditures occur within the Twelve Mile/Hill Top MOAs, and 25 percent are expended within the R-3403 airspace. Under the Proposed Action, the number of chaff and flare expenditures are expected to remain the same as previous use, as depicted in Table 2-3, and would be expended within the same SUA. The altitudes that aircraft release the chaff and flare vary, but expenditures would be released no lower than 2,000 feet AGL above the MOA training areas. Within restricted training areas above property owned by DOD, chaff and flare are expended within given range limits.

Chaff and **flare** are defense countermeasures deployed from military aircraft during combat maneuvers to avoid detection and/or attack by adversary air defense systems such as radar and heat-seeking missiles. Chaff consists of very thin fibers that reflect radar signals and can, when released in large quantities, form a cloud that temporarily hides the aircraft from radar detection. Flares consist of high-temperature heat sources ejected from aircraft, serving as a decoy for heat-seeking targeting systems.

Modern chaff primarily composed of silica and aluminum, which become indistinguishable from soil materials once the chaff breaks down, as well as stearic acid and palmitic acid used as an anticlumping agent. Flares are primarily magnesium and a small amount of Teflon and aluminum coating, which burn almost completely to ash. Dud flares are highly unlikely (~1 in 10,000) but, if they did occur, they would be distributed over the entire area. The components and residuals of chaff and flare would not be expected to measurably impact land or water environments, sensitive biological species, humans, or human activities.

(ACC, 1997; 2011)

Table 2-3 Chaff and Flare Use by the 122d Fighter Wing

Component	Chaff	Flare
Types	RR-188	M206
FY19 Allocation[1]	3,038	8,260
Locations	Predominantly Twelve Mile/Hill Top MOAs or R-3403	
Altitude Expended	Varies, generally 2,000 AGL or higher for both chaff and flare over areas not owned by DOD.	

[1] FY19 allocations are used as the most representative chaff and flare expenditures; FY20 operations and associated chaff and flare allocations were reduced due to the COVID-19 pandemic.

Key: AGL = above ground level; DOD = Department of Defense; FY = Fiscal Year; MOA = Military Operations Area; R- = Restricted.

Additional Personnel

The Proposed Action would result in an increase of 100 personnel at Fort Wayne ANGB to achieve the manpower requirements of the F-16 fighter mission. Approximately 90 percent of these personnel would be on the installation for the unit two-day training drill that is typically conducted once per month. Therefore, about 10 additional personnel would be employed full-time, and 90 additional personnel would be on the installation one weekend per month. Like existing personnel at Fort Wayne ANGB, the new personnel and their families would live in the community across the region.

Facilities Projects

In support of the proposed F-16 conversion, 17 new construction, renovation, and demolition projects would occur to satisfy mission requirements from the change in A-10 to F-16 aircraft. The construction would include associated infrastructure and would comply with NGB standards and antiterrorism/force protection (AT/FP) requirements. The proposed facilities projects are summarized in Table 2-4 and depicted in Figure 2-2 and Figure 2-3 with corresponding numbers to illustrate each project's location. The proposed facilities projects would be phased over ten years.

(1) Secure Office Space. This project would require the renovation of 333 square feet of secure office space. Renovation would be completed in accordance with Intelligence Community Directive/Intelligence Community Standards 705. It would include fire protection, an access control system, and communications support. Current office space would be reconfigured to meet operational needs.

(2) Install F-16 Aircraft Arresting System. Primary and secondary arresting systems would be installed to support the upcoming conversion. Currently, Runway 5/23 has no aircraft arresting systems. This project would install concrete pits on both ends of Runway 5/23. Construction would include modifying existing pavements and constructing new textile foundations, access pavements, and associated site work; altering some runway lighting; and demolishing some existing foundations, pavements, and lighting.

(3) Munitions Maintenance (MX)/Storage Complex. The current Munitions MX and Storage Complex lacks adequate munitions maintenance and storage space, and the existing buildings are geographically separated by a busy roadway. This project would construct an appropriately sized, sited, and configured munitions storage area, including maintenance and inspection, munitions

storage igloo, munitions assembly complex area, inert storage, and aboveground munitions storage. The storage facilities would be collocated with other installation munitions facilities to maintain safety and operational standards and eliminate the need to travel across a roadway to access facilities within the complex. Following new munitions MX and storage construction, an existing storage facility (Bldg. 790) would be demolished. Additional paved areas and roadways would also be included. Each munitions facility would have a paved accessway to the building, Bldgs. 906 and 907 would be surrounded by paved areas, and a circular roadway would be constructed between Bldgs. 904/905 and 909.

(4) Repair Aircraft Parking Apron. To accommodate the 24 PAA F-16 aircraft with an adequately sized and properly configured parking apron, the existing parking infrastructure would be upgraded and repaired. This project would remove the current parking systems and install the required grounding and tie-down points, repair pavement surface, repair the trim pad, and restripe the pavement markings. The parking apron would meet the operational requirements of the F-16 aircraft and conform to the requirements of the Airfield Obstruction Reduction Initiative, AFI 32-1043, and 35E8-series Technical Order requirements.

Table 2-4 Proposed Facilities Projects to Support the F-16 Mission

No.	Project Title	Location	Type	Construction Year
1	Secure Office Space	Existing Bldg.	Renovation	2022
2	Install F-16 Aircraft Arresting System	Runway 5/23	Construction	2022
3	Munitions MX/Storage Complex	Multiple	Construction	2023
4	Repair Aircraft Parking Apron	Parking Apron	Renovation	2023
5	Repair Squadron Operations Facility	Bldg. 753	Renovation	‘2024
6	Repair Bldg. 756	Bldg. 756	Renovation	2024
7	Repair Small Arms Range	Bldg. 786	Renovation	2025
8	Renovate Hangar and Repair Fire Suppression	Bldg. 734	Renovation	2025
9	Hydrazine Storage	New	Construction	2025
10	Addition to Weapons Release Facility	Bldg. 764	Construction	2025
11	Mission Training Center	South of Bldg. 784	Construction	2026
12	Modernize Corrosion Control	Bldg. 732	Renovation	2027
13	Repair Fire Suppression Facility	Bldg. 800	Renovation	2027
14	New AGE Low-Pressure Fill Stand	Adjacent to Bldg. 730	Construction	2027
15	Construct Fitness Center	Inside Fitness Track	Construction	2027
16	Repair Bravo Arm/De-Arm Pad	Bravo Pad	Renovation	2031
17	Demolish Bldg. 758	Bldg. 758	Demolition	2031

Key: AGE = Aerospace Ground Equipment; Bldg. = Building; MX = Maintenance.

Figure 2-2 Location of the Proposed Facilities Projects to Support the F-16 Mission within Fort Wayne ANGB Boundaries

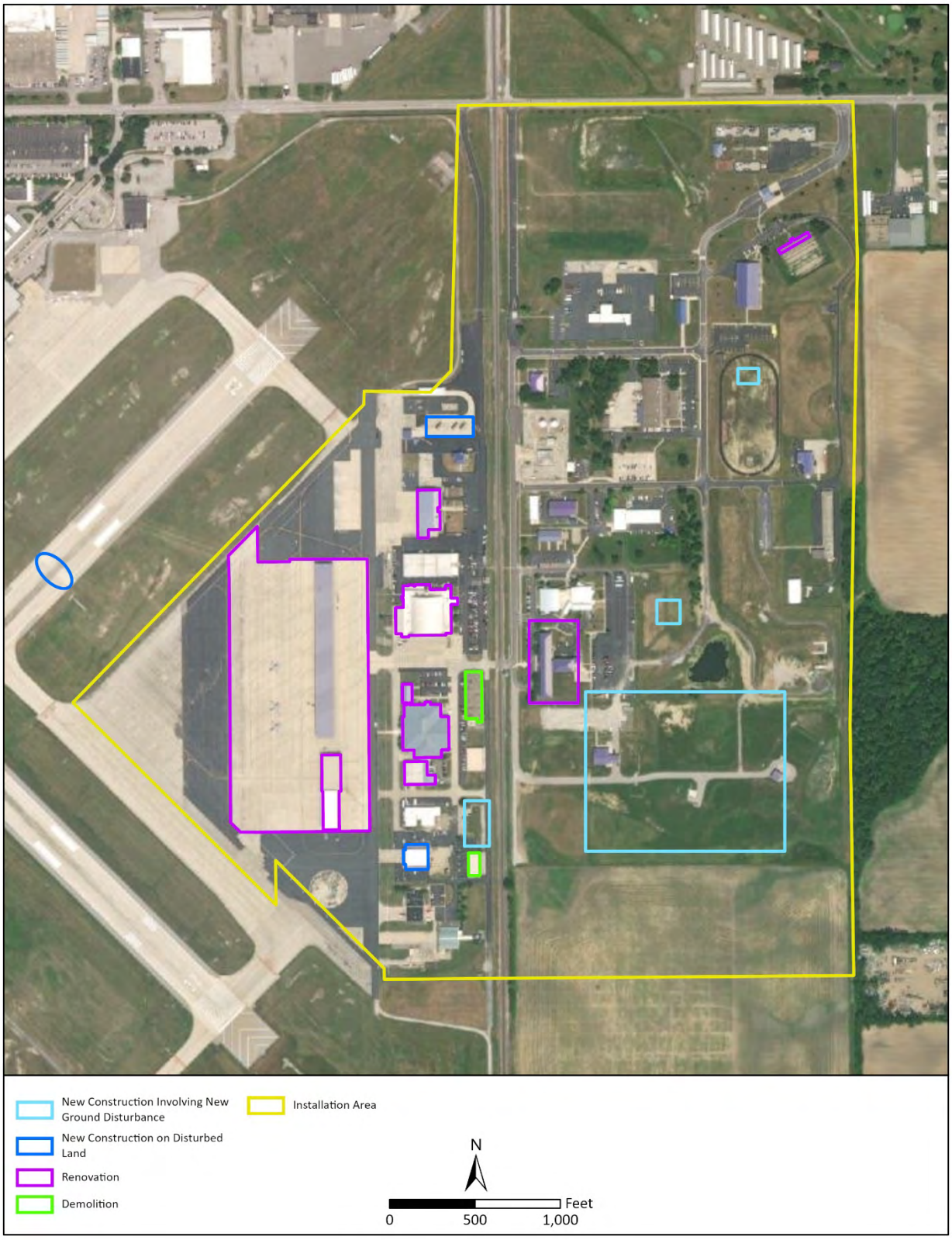


Figure 2-3 Location of the Proposed Facilities Projects to Support the F-16 Mission outside Fort Wayne ANGB Boundaries

(5) Repair Squadron Operations Facility. The existing squadron operations facility (Bldg. 753) would be renovated to accommodate the F-16 operations and maintenance requirements, as the existing building lacks adequate space. The project would include vault upgrades, Secure Access facilities, a Joint Worldwide Intelligence Communications System Sensitive Compartmented Information (SCIF) area, an Optimize Human Weapons System functional area, maintenance debrief area, and operations office renovations. The current A-10 mission training simulators and the installation fitness center are located in Bldg. 753. Space for the training simulators (F-16) and the fitness center would need to be moved (see Projects 11 and 15, respectively).

(6) Repair Bldg. 756. Repairs to the Engine Shop (Bldg. 756) are necessary to bring the facility to NGB mission standards. The roof of Bldg. 756 would be replaced, including removing and replacing the existing metal roof, approximately 13,225 square feet total. In addition, the existing HVAC would be replaced; plumbing would be repaired; mezzanine exits would be added; concrete masonry would be repaired or replaced, as needed, and sealed; and an epoxy floor coating would be added.

(7) Repair Small Arms Range. The small arms range would be renovated to include the repair of baffles, replacement of the range backstop cap, and repair of the firing positions. The small arms range supports assigned personnel in maintaining overall 122 FW mission readiness.

(8) Renovate Hangar and Repair Fire Suppression. Upgrades to the fire suppression equipment at the Maintenance Hangar would be necessary to bring the building to the current UFC standard, including a wet sprinkler system upgrade, High-Expansion Foam (HEF) (a fire suppressant) system update, avionics air conditioning for maintenance requirements, and other requirements for F-16 mission specialized materials.

(9) Hydrazine Storage. A 200-square-foot hydrazine storage facility would be constructed to provide space for the storage of hydrazine fuel containers. The storage shed would be built on a concrete pad with a lockable fence enclosure. F-16 aircraft carry hydrazine as part of an emergency power unit. Hydrazine storage is the only requirement for the F-16 aircraft at Fort Wayne ANGB; no service station is required as it is regionally serviced. Each F-16 requires one hydrazine cylinder, which holds 6.8 gallons of H-70 (an aqueous solution of 70 percent hydrazine and 30 percent water). The installation would store cylinders of H-70 sufficient to meet the requirements of the proposed 24 F-16 aircraft, as well as spare cylinders. The installation would keep the cylinders within the storage facility and adhere to all planning and reporting requirements.

(10) Addition to Weapons Release Facility. A 4,000-square-foot addition to the existing weapons release facility would be constructed to support the F-16 mission. The building construction includes site work, foundations, structural, electrical, mechanical, fire protection, and limited interior finishes consistent with the existing building.

(11) Mission Training Center. A 13,000-square-foot training center would be constructed to support the F-16 mission training and maintenance activities and to accommodate aircraft simulators. The center would include a high-bay area to house four F-16 simulator bays, training rooms, administrative support areas, storage, and restrooms. The training center would be constructed to meet SCIF specifications.

(12) Modernize Corrosion Control. Renovation of the Corrosion Control facility (Bldg. 732) would correct current deficiencies, improve the aircraft structural maintenance process, and protect personnel health and safety. The renovation would include installing an anteroom air break, interior access doors between the north and south hangar bays, restroom/shower/locker room facility, upgrades to aircraft structural maintenance equipment, repairs to safety devices, and removal of the existing hydroblaster equipment. A safe and effective HEF and wet pipe sprinkler systems are needed in each hangar to support the F-16 aircraft, and these systems would be upgraded to meet the current UFC standard.

(13) Repair Fire Suppression Facility. The existing HEF and wet pipe fire suppression systems in Bldg. 800 (Aircraft Shelter) do not meet the current UFC standard, and 122 FW requires safe and effective fire suppression systems in each hangar to support F-16 aircraft. This project would replace the existing HEF and wet pipe sprinkler systems with new, upgraded systems. In addition, the current, degraded epoxy flooring would be resurfaced and traffic/taxi lines would be restriped to meet the F-16 aircraft requirements.

(14) New AGE Low-Pressure Fill Stand. The AGE equipment associated with F-16 maintenance has a large fuel requirement compared to the A-10 maintenance requirement. A low-pressure fill stand would be constructed on the west side of the installation to reduce the need for the fuel bowser to cross the Norfolk Southern Railroad to obtain fuel from the eastern side of the installation. A fuel bowser is a fuel tank on wheels that is used to deliver fuel to aircraft.

(15) Construct Fitness Center. The existing Fort Wayne ANGB gym is located within the Squadron Operations Building (Bldg. 753), which is being renovated under Project 6 to accommodate the F-16 mission requirements, eliminating the space for the gym. A replacement gym would be required. A 2,400-square-foot fitness center would be constructed to support assigned personnel in maintaining ANG fitness standards.

(16) Repair Bravo Arm/De-Arm Pad. The existing Bravo arm/de-arm pad on the airfield is designed for A-10 aircraft. This project would comprise pavement upgrades and repairs to accommodate the F-16 aircraft, including installing required grounding and tie-down points, surface repairs, restriping, and lighting. This system is an operational requirement of the Airfield Operations Board to ensure flight safety for both assigned and transient aircraft.

(17) Demolish Building 758. This project would demolish the existing 15,264-square-foot Bldg. 758, which housed the welding shop. The welding shop is being relocated to another building (Bldg. 740), and Bldg. 758 is no longer needed.

2.2 NO ACTION ALTERNATIVE (ALTERNATIVE B)

The No Action Alternative would result in no change to the 122 FW mission. Aircraft operations under the current mission would continue with no change. The A-10 aircraft mission would remain in place at Fort Wayne ANGB until the projected end of the airframe mission or until future required mission change proposals. Any previously planned, approved, and programmed construction and repair projects would continue, and no new construction projects would be implemented. Some of the proposed renovation projects would not occur and building conditions may continue to deteriorate. Personnel would remain at current levels. The No Action Alternative does not fulfill the

purpose of and need for the Proposed Action; however, it will be carried forward for detailed analysis in accordance with 40 CFR 1501.9 and 32 CFR 989.8.

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR DETAILED ANALYSIS

CEQ and EIAP guidance for implementation of NEPA require the consideration of all reasonable alternatives to a Proposed Action; a reasonable alternative meets the underlying purpose and need for the Proposed Action. Reasonable alternatives may be eliminated from detailed analysis based on operational, technical, or environmental standards (32 CFR 989.8).

The aircraft conversion permitted under Section 134, part (f) Special Rule, National Defense Authorization Act FY17, H.R. 4909 (Report No. 114-537, Public Law 114-328) is specifically for replacement of A-10 aircraft with F-16 aircraft at Fort Wayne ANGB. The rule does not specify any other aircraft conversions that could be analyzed under this action. In addition, the Indiana ANG does not own another alternate airfield location with adequate airfield facilities that could house the proposed F-16 aircraft mission. Therefore, no other alternatives for the aircraft conversion are being considered.

Given that the F-16 was previously based at Fort Wayne ANGB, the F-16 mission can utilize the same training airspace as it did in 2011. As previously discussed, the F-16 mission would require more supersonic flight training than the A-10 mission. Supersonic flights are approved in the Buckeye MOA over 30,000 feet MSL and F-16s currently conduct this training in the Buckeye MOA. Supersonic flight training under the Proposed Action would be comparable to the supersonic flight training that occurred under prior F-16 operations at the 122 FW. The current airspace meets the proposed F-16 training requirements. Furthermore, the airspace outside of this region would require either additional agreements with a controlling agency or longer flight times. Therefore, no other SUA was considered as an alternative.

A comprehensive replacement of existing facilities with all new construction to meet the needs of the F-16 mission with right-size buildings and correct configurations was considered. This alternative was eliminated from further analysis in this EA due to cost and time availability of funds. No additional alternatives for facilities projects were identified for detailed evaluation. Off-installation leasing for new facilities would create security concerns, and personnel would need to travel back and forth to the installation, which would impact the 122 FW operational mission. The proposed facility and infrastructure locations were selected to maintain the functions of existing buildings and locations while considering known operational and environmental constraints. Therefore, alternative construction sites within the installation boundary would have similar environmental impacts as those addressed in the Proposed Action and a detailed analysis would therefore not be warranted. This alternative was considered but is not being carried forward for detailed analysis in the EA.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents a description of the baseline conditions of the relevant environmental resources that could be reasonably affected from implementing either of the alternatives. The section also includes an analysis of the potential effects that could be expected from the implementation of each alternative.

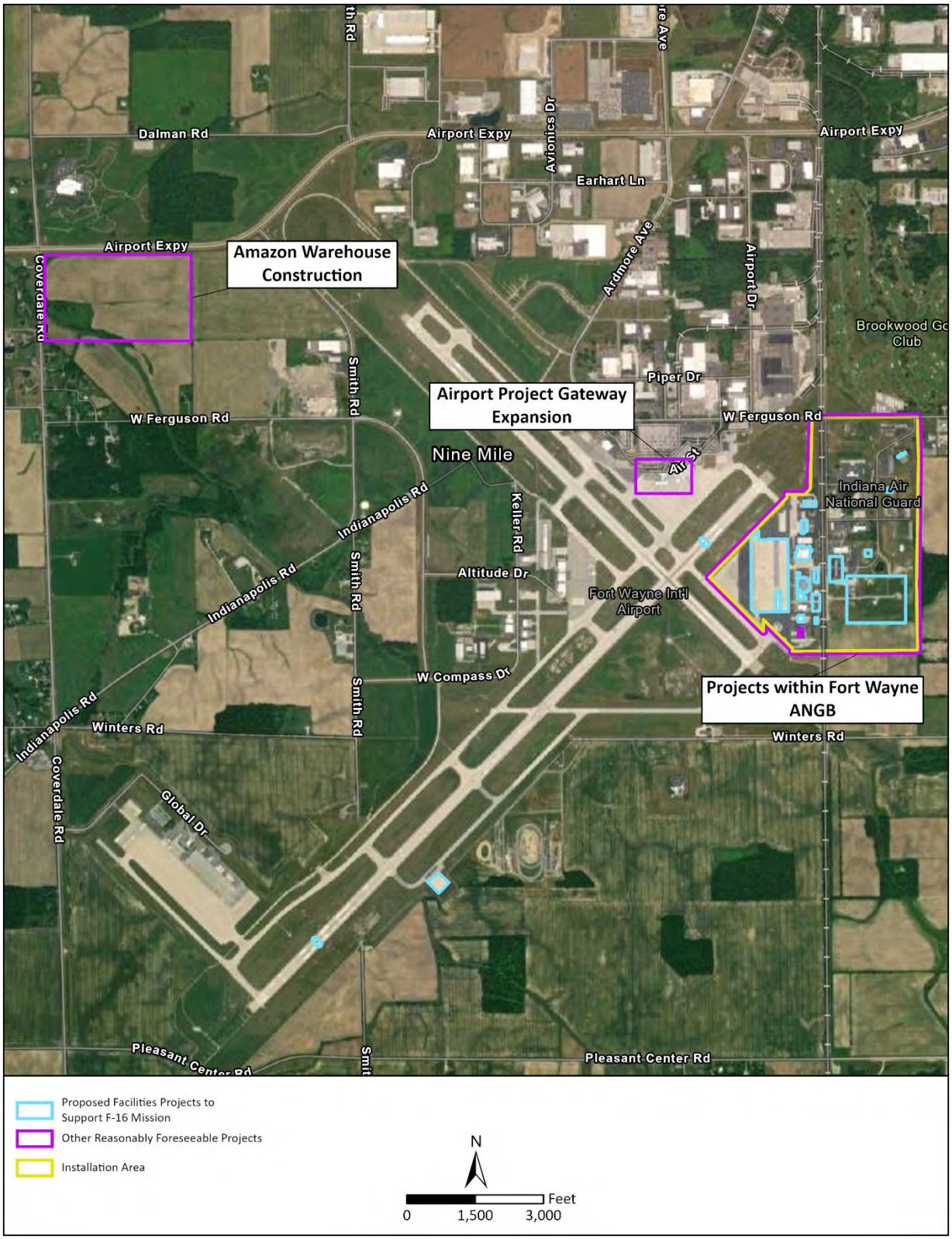
All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA per CEQ and EIAP guidelines, the affected environment and environmental consequence analysis focuses on those resource areas potentially subject to impacts, with the level of detail used in describing a resource proportionate with the anticipated level of potential environmental impact. Accordingly, this chapter discusses in detail the following resource areas: safety and aircraft safety; airspace management; air quality; climate change; noise and noise compatible land use; water resources; biological resources; historic properties; and hazardous materials, solid waste, and pollution prevention.

Potential impacts on other resource areas were considered, and those with impacts expected to be negligible or nonexistent are therefore eliminated from further consideration in this EA. These resource areas include coastal resources; Department of Transportation Act Section 4(f) resources; land use; geological resources; infrastructure and transportation; visual resources; and socioeconomics, Environmental Justice, and children's environmental health and safety risks. Rationale for not considering these resource areas in detail are described in Appendix A.

3.1 OTHER PROPOSED ACTIONS WITH CLOSE CAUSAL RELATIONSHIPS

Other projects that are reasonably foreseeable and identified as having close causal relationships to the Proposed Action are considered part of the affected environment for each resource area. Impacts that result from the Proposed Action, when added to other reasonably foreseeable actions, could result in incremental impacts on resources that could cause a collective impact over time. The scope of the effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. The effects analysis qualitatively considers other reasonably foreseeable projects occurring within the same time frame and geographic extent as the Proposed Action, which are summarized in Section 3.1.1. The locations of the projects in the vicinity of Fort Wayne ANGB are shown in Figure 3-1.

Figure 3-1 Locations of Other Proposed Projects in Impacts Analysis



3.1.1 Projects Considered

Modification and Addition of Airspace at the Alpena Combat Readiness Training Center (CRTC) Special Use Airspace (SUA) Complex. NGB is proposing a modification, expansion, and utilization of the Alpena SUA Complex in Michigan. The Alpena CRTC schedules and hosts local, regional, and deployed unit training exercises within the existing Alpena Complex. The 122 FW does not routinely use the Alpena SUA Complex, but may use the airspace on occasion. Because the airspace is within 200 miles of the Fort Wayne ANGB, is occasionally used by the 122 FW, and is being proposed within the same timeframe as the Proposed Action, the proposed modifications to the Alpena CRTC airspace are considered a reasonably foreseeable action with a close causal relationship to be included in the analysis for potential effects. The proposed action includes the following modifications and additions to the airspace:

- establishing five new MOAs (Grayling East, Grayling West, Steelhead Low North, Steelhead Low South, and Steelhead Low East)
- discontinuing the annual request for the Grayling Temporary MOA
- modifying the internal lateral boundaries of three existing MOAs (Pike East, Pike West, and Steelhead)
- returning Hersey MOA to the NAS
- raising the vertical ceiling of R-4201B
- establishing two new MTRs (VR-1601 and VR-1602)

Numerous DOD agencies would use the proposed airspace improvements, and the primary users of the MOAs would conduct exercises with A-10 and F-16 aircraft, but transient users would conduct exercises with a variety of fixed-wing aircraft and rotorcraft. NGB is preparing an EA for the Alpena SUA Complex modifications.

Stormwater Improvements on Fort Wayne ANGB. Fort Wayne ANGB is planning to repair and upgrade the existing stormwater collection and retention system on the installation. This action would correct the aging stormwater system, which will prevent localized flooding and pollution potential. Stormwater inlets and the stormwater piping system would be resized. The current open channel stormwater ditches and roadside swales would be reshaped and regraded. The project would install stormwater retention and stormwater/oil separator structures and outflows. The existing deteriorated and undersized catchment basins would be upgraded. This project is anticipated for 2023 and will undergo separate NEPA analysis once the scope and design of the project are established.

Fire Station Construction and Repair. The Fort Wayne ANGB fire station requires an addition to accommodate the mission of the facility. The fire station is approximately 20 years old and lacks adequate administrative space, storage, and equipment support areas. The building will be brought into compliance with UFC and ANG criteria. There will be a 6,200-square-foot addition to the existing building, as well as an interior reconfiguration, lightning protection, roof, air conditioning, fume extraction systems, and AT/FP-compliant windows. Fort Wayne ANGB completed an EA for this project, and a Finding of No Significant Impact was signed in 2011. This project has been evaluated by the NGB against current conditions, and there are no significant changes to the baseline conditions to this action; therefore, the Finding of No Significant Impact remains accurate. This project is anticipated to begin in 2021.

Fort Wayne International Airport Master Plan Improvements and Expansion. The 2012 Fort Wayne International Airport Master Plan outlines facilities and land development considerations for a 20-year timeframe and beyond. The master plan forecasts a 35.2 percent increase in annual operations by air carriers at the airport from 2010–2030, and a 20.02 percent increase in overall aircraft operations from 2010–2030. The master plan assessed airport facility requirements to accommodate the anticipated growth, which included extended and improved taxiways, reconfiguration and additions to the passenger terminal area, relocation of the fixed-based operator to the West Ramp, a new access road, and terminal roadway access improvements. The proposed development would occur over three phases (RW Armstrong, 2012).

Fort Wayne International Airport Project Gateway Expansion. FWA is undergoing multiple terminal apron improvement projects and is in the design process to expand the terminals at the airport. In 2020, the airport began a Terminal Apron Improvement Project which expanded the terminal ramp, realigned perimeter fencing and roadway, and added a service vehicle road (FWA, 2020). Construction to expand the west terminal began in the spring of 2021 and is expected to take two years to complete. The expansion will allow the airport to accommodate larger planes and will add two gates, resulting in a total of 10 passenger gates at the airport. The west terminal expansion project will include an expanded ticketing area, new baggage handling system, additional jet bridges, new holding rooms, expanded or renovated mechanical systems, and a modernized interior and front facade (Noll, 2020). The east terminal will also eventually be expanded and renovated.

Amazon Warehouse Construction. The Fort Wayne-Allen County Airport Authority sold approximately 138 acres of land on Airport Expressway between Smith Road and Coverdale Road in October 2020. The property will be developed into an Amazon fulfillment center, which will create approximately 1,000 full-time jobs. The fulfillment center is expected to open in 2021 (Darby, 2020).

3.2 SAFETY/AIRCRAFT SAFETY

3.2.1 Definition of Resource

Safety/aircraft safety relates to both military training flight safety and ground safety. Military training flight safety is primarily concerning the potential for aircraft accidents, which may be caused by weather-related accidents, mechanical failure, pilot error, mid-air collisions with manmade structures or terrain, or bird/wildlife-aircraft strikes. On the ground, airfield and operational safety criteria limit the siting of proposed development or expansion of facilities to take setbacks and standoff distances into consideration, as well as the appropriate design, handling, and response for any dangers to health and human safety.

The study area for safety/aircraft safety includes Fort Wayne ANGB, the airfield, and the airspace to be used by the proposed F-16 aircraft.

3.2.2 Affected Environment

Ground Safety

On the ground, airfield safety criteria limit the siting of proposed development or expansion of facilities to take setbacks and standoff distances into consideration. The DOD AT/FP requirements and standards are designed to reduce the likelihood of mass casualties from potential terrorist attacks. UFC 4-010-01, *DOD Minimum Anti-Terrorism Standards for Buildings* (Change 1, August 19,

2020) outlines various planning, construction, and operational standards to incorporate mitigating measures associated with potential terrorist threats. The AT/FP standards include the establishment of minimum setbacks and other security standoffs between gathering facilities and potentially nonsecure adjacent uses, such as parking lots and areas outside of security fences. The DOD UFC AT/FP standards are required for all new construction, and for certain renovations or modifications for existing inhabited buildings.

Siting requirements for explosive material storage and handling facilities are also based on safety and security criteria. Explosive-Safety Quantity-Distance (ESQD) arcs are maintained between these facilities and other facilities. ESQD arcs are determined by the type and quantity of explosive materials stored within the facility. Within defined ESQD arcs, development is either restricted or prohibited to maintain safety of personnel and minimize the potential for damage to other facilities in the event of an accident. The current munitions storage area on 122 FW has associated ESQD arcs, and in accordance with DAF regulations, inhabited buildings are not authorized within 100 feet of these buildings, and the land within the ESQD arcs are constrained against future development.

Bird/Wildlife Aircraft Strike Hazard

The Bird/Wildlife Aircraft Strike Hazard (BASH) program has procedures to identify the level of risk associated with the presence of the hazard level due to site conditions. BASH is a safety concern at all airfields due to the frequency of aircraft operations and the potential for encountering birds at any altitude. Bird/wildlife aircraft strikes can result in damage to aircraft or injury to aircrews, or to local populations if the strike caused an aircraft to crash. Aircraft may encounter birds at altitude up to 30,000 feet MSL. Over 90 percent of reported bird strikes are at or below 3,000 feet AGL, though strikes at higher altitudes are more common during migration. Ducks and geese are frequently observed up to 7,000 feet AGL during migration, and pilots are cautioned to minimize en route flying at lower altitudes during migration times, including the months of March to April and August to November (FAA, 2020b).

The Fort Wayne ANGB is located within the Mississippi Flyway for migratory birds, which is used by waterfowl, raptors, shorebirds, wading birds, and flocking passerines during migration. No single solution exists to address BASH risks. Operational risk management solutions include the following:

- limit takeoffs and landing within one hour on either side of dawn and dusk
- limit flying time in the low-altitude training environment
- where possible, implement habitat management to reduce the desirability of the area for use by birds and other wildlife
- ensure current bird activity data are available for aircrew briefings, including DAF Avian Hazard Advisory System data from the BASH Team website

To manage BASH risks, the 122 FW has a BASH Plan (INANG, 2017a) and a Bird Hazard Working Group that meets quarterly with participation of U.S. Department of Agriculture Wildlife Service, FWA staff, and ATC. The BASH Plan identifies three potential bird and wildlife attractants located within two miles of Runway 14. One is a gravel pit operation, the second is the municipal solid waste facility, and the third is Fox Island County Park. Most of the FWA airfield is fenced at a height that provides deterrence to deer and other mammals. The turf around the airfield is maintained to further deter birds and other wildlife, and the airfield is generally free of perch sites near taxiways and

runways. Several retention/detention ponds on the airport property and within Fort Wayne ANGB boundaries are potential hazardous wildlife attractants, and management actions have been implemented to deter waterfowl from these areas (INANG, 2017a).

From 2007 through 2017, the 122 FW reported 34 bird/wildlife strikes. Most strikes did not cause damage to the aircraft and involved smaller species. Most strikes also occurred in summer and early fall, suggesting a moderate influence of fall migration and mid-summer activity due to an increase in young birds and summer insect feeders (INANG, 2017a).

The 122 FW uses the DAF Avian Hazard Advisory System website, which provides graphic output (i.e., maps and charts) that indicate bird strike risk on low-level routes, ranges, MOAs, LATN areas, and other SUA. The web-based system primarily uses data from a nationwide system of weather radars and predicts bird strike risk in many areas based on weather forecast data. This system is used to ensure risk levels in the airspace beyond FWA are known and addressed before training missions are sent into airspace. The Avian Hazard Advisory System includes a Bird Avoidance Model that shows a distribution map of potentially hazardous bird species derived from decades of bird counts and surveys and other state and federal datasets. For two-week intervals, this Bird Avoidance Model predicts bird activity over four daily time periods: day, night, dawn, and dusk. In addition, the 122 FW BASH Plan outlines the 122 FW Bird Hazard Warning System, which establishes procedures for information exchange between ground agencies and aircrews concerning the location of birds that may pose a flight safety hazard. If bird activity is observed on or near the active runway, modifications to takeoffs and landings may occur (INANG, 2017a).

A Bird Hazard Warning System is used to report significant bird activity away from the installation. Range Control Officers consult the Avian Hazard Advisory System and, together with Pilot Reports or visual observations, provide current Bird Watch Conditions to aircrews entering the airspace. Bird Watch Conditions severe or moderate are relayed to aircrews; Bird Watch Condition low may be relayed at the discretion of the Officers or at the request of the aircrew. When Bird Watch Conditions are severe, takeoffs or landings may be restricted at the airfield. In SUAs, specific areas and altitudes that are deemed severe will be identified and those areas will be avoided by all flights when possible. When Bird Watch Conditions are moderate, traffic may be limited and low approaches may be restricted at the airfield. In SUAs, commanders may make appropriate changes to minimize bird strike risk. Such changes could include avoidance of known/observed concentrations, raising flight altitudes, and reducing airspeed (INANG, 2017a). These systems and the installation BASH program are utilized to address the risks of bird/wildlife strikes and to avoid conflicts between military aircraft and birds/wildlife in the airspace.

Aircraft Safety

Safety of aircraft operations is often described in terms of the aircraft's "mishap rate," represented by the number of mishaps per 100,000 flying hours for each aircraft type. Most aircraft accidents involve a takeoff or landing incident. High-performance maneuvering, such as operations typically occurring in a MOA, also have a relatively high mishap rate.

Disciplined focus on safety across all aspects of aviation, whether military or civil, is one principal foundation enabling safe and effective flight operations. This focus also contributes to limited risk for nonparticipants on the ground. The 122 FW pilots and aircrews are prepared to do so safely based

on training, experience, and processes and procedures mandated by regulatory guidance developed over decades of military aviation.

Aircraft mishaps are categorized according to injury and damage (DOD, 2018):

- Class A: results in death, permanent total disability, damage equal to or greater than $2 million, or a destroyed aircraft (excluding some unmanned systems)
- Class B: results in permanent partial disability, damage equal to or greater than $500,000, or hospitalization for inpatient care of three or more individuals
- Class C: results in a nonfatal injury or occupational illness that caused loss of one or more days from work not including the day or shift it occurred, or damage equal to or greater than $50,000
- Class D: recordable injury or illness not classified as A, B, or C; or damage equal to or greater than $20,000

Mishap rates for A-10 and F-16 aircraft are shown in Table 3-1. These rates are calculated for all DAF flying operations, not for the 122 FW specifically. Flight safety is a critical component of all training missions conducted by the 122 FW. Within the past ten years, the 122 FW has not had any Class A mishaps and no Class B injuries.

Table 3-1 General Mishap Rates by Aircraft Type

Aircraft	Class A Mishap Rate	Class B Mishap Rate	Pilot Fatality Rate	Overall Fatality Rate	Total Hours Flown (FY19)
A-10	1.88	3.2	0.9	1.03	5,652,298
F-16	3.35	0.96	0.76	1.14	11,278,471

(Air Force Safety Center, 2019)
Notes: Mishap and fatality rates are per 100,000 flight hours.

At FWA, the 122 FW must share existing runways and taxiways with civilian aircraft. Proposed construction or modifications to existing facilities must respect FAA airfield criteria beyond the designated ANG property boundary, and the more stringent DAF airfield criteria are applied within the ANG leasehold boundaries (INANG, 2011a). FWA has established runway protection zones (RPZs) for the airport runways. The RPZs are under the control of the airport authorities to protect the safety of approaching aircraft by keeping the area clear of obstacles. The RPZ for Runways 05/23 and 14/23 accommodate approach visibility minimums lower than three-quarters of a mile. They are trapezoidal in shape and centered about each runway's extended centerline. The inner width of both RPZs begin 200 feet prior to each runway's threshold. The primary surfaces at FWA are established by the airport in accordance with FAA Part 77 regulations and accommodate a precision 50:1 approach for Runways 05/23 and 14/23 (INANG, 2011a).

3.2.3 Significance Criteria

Significant impacts on safety or aircraft safety would occur if an action would substantially increase the risks associated with the safety of personnel, Guardsmen, or the general public; or introduce a new safety risk for which the ANG is not prepared or does not have adequate management and response plans in place.

3.2.4 Environmental Consequences

Proposed Action (Alternative A)

The basing of the F-16 aircraft would not result in substantial changes in ground or flight safety procedures at Fort Wayne ANGB. The additional 100 personnel under the Proposed Action would provide the necessary manpower adjustments, and the proposed facility construction and improvements would support the mission of the F-16 aircraft. The additional personnel and facility projects would provide adequate capacity for the 122 FW to perform routine functions safely. The Proposed Action would result in minor beneficial impacts and minor adverse impacts on safety and aircraft safety. Under the Proposed Action, impacts on safety and aircraft safety would be less than significant.

Ground Safety

Implementation of the Proposed Action is not expected to create new or unique ground safety issues. Base personnel safety procedures would not change from the current conditions, and all activities would continue to be conducted in accordance with applicable regulations, technical orders, and ANG standards. Renovation and construction activities would comply with applicable safety regulations and would not pose a significant safety risk to personnel or workers. New construction would adhere to the UFC AT/FP standards and requirements. The facilities projects proposed would bring several existing buildings into compliance with current ANG safety standards, benefiting overall safety on the installation.

Several of the proposed renovation and construction projects would involve upgrades to the existing fire suppression systems (Projects 1, 8, 10, 12, and 13), which would reduce the risk of fire hazard to personnel and aircraft and would result in benefits on overall fire safety on the installation. The renovation of the Corrosion Control facility (Project 12) would involve repairs and renovations to safety devices and correct current deficiencies to protect personnel health and safety.

The F-16 arresting system (Project 2) and arm/de-arm pad (Project 16) are necessary to support F-16 mission safety. The arm/de-arm pad would remain in its current location away from incompatible land uses for safety compliance, and would undergo repairs and upgrades to accommodate the F-16 aircraft mission.

The proposed Munitions Storage Complex (Project 3) would be located in the southeast portion of the installation. The DOD Explosives Safety Board 6055.9-Standard and Air Force Manual 91-201, *Explosives Safety Standards*, contain DOD and DAF guidelines for complying with explosives safety. Siting requirements for munitions and ammunition storage and handling facilities are based on safety and security criteria. Defined distances (ESQD) are maintained between munitions storage areas and other types of facilities based on the type and quantity of explosive material to be stored to ensure personnel safety and minimize potential for damage to other facilities in the event of an accident. Explosives storage and handling facilities must be located in areas where security of the munitions can be maintained at all times, and construction is not permitted within the ESQD arcs. The proposed site for Project 3 has been evaluated by the NGB for compliance with ammunition and explosives safety standards; the DOD Explosives Safety Board has reviewed the siting of these facilities with their ESQD arcs and has approved the location and use of these facilities for munitions and explosives storage (DDESB, 2014).

Project 9 entails constructing a hydrazine storage facility to provide secure space for hydrazine fuel containers. Hydrazine is considered an extremely hazardous substance as defined by Section 304 of the Emergency Planning and Community Right-to-Know Act (EPCRA). This storage facility would adhere to the ANG safety standards for hydrazine storage, and the handling of hydrazine would be in accordance with Air Force Technical Order 42B1-1-18, *General Procedures Handling of H-70 (Hydrazine - Water Fuel)*. In addition, the 122 FW would prepare a Hydrazine Response Plan to identify the procedures for the safe response and control of any emergency incidents involving hydrazine. Additional information on hydrazine is included in Section 3.10, Hazardous Materials, Solid Waste, and Pollution Prevention. A safety arc is associated with hydrazine storage; H-70 cannot be stored within 100 feet of public traffic routes, inhabited buildings, civilian or government leasing areas, and public facilities. Further, H-70 cannot be stored within a specified distance of oxidizers, (130 feet for the 122 FW, which would have between 1,000 and 2,000 pounds of hydrazine). The proposed hydrazine storage facility would be sited with the required safety arcs, and only open space and parking areas would be within 100 feet of the proposed storage building.

Ground safety associated with the Proposed Action would not substantially increase the safety risks of personnel Guardsmen, or the general public, and the ANG has adequate management and response plans in place for the reintroduction of hydrazine at Fort Wayne ANGB. Therefore, impacts would be less than significant on ground safety.

Bird/Wildlife Aircraft Strike Hazard

Under the Proposed Action, F-16 aircraft would replace the A-10 aircraft at Fort Wayne ANGB. Similar to existing flying operations, the proposed F-16s would adhere to the established flight safety guidelines and protocol. The Proposed Action would result in a small net increase in airfield operations conducted by the 122 FW; however, the installation's BASH program, which includes tools such as the Avian Hazard Advisory System and other safety measures, would continue to be used to assess the potential for bird/wildlife within the airspace utilized by the F-16s. Adherence to the 122 FW BASH Plan would allow Airmen to assess and address the avian risk levels in the airspace, minimizing the risks of conflict between military aircraft and bird/wildlife strike hazards. Safety risks associated with bird/wildlife strikes would not be expected to increase. Safety risks associated with BASH would be less than significant under the Proposed Action.

Aircraft Safety

The primary public concern regarding flight safety is the potential for aircraft accidents (or mishaps). An increase in aircraft flight activities is often associated with an increased risk of aircraft mishaps. Although many investigations have been conducted to determine a direct cause and effect relationship between operational levels and aircraft mishaps, results are generally inconclusive because so many other unpredictable hazard factors (e.g., weather, operating environments, technical failures, terrorist actions, and pilot proficiency) can contribute to whether an accident occurs or is prevented (Congressional Research Service, 2003).

In probability analysis, an aircraft mishap is a low-probability, high-consequence risk because pilots are trained, and aircraft are designed, to ensure that aircraft accidents are rare events. F-16 qualification and continuation training requirements include preparing pilots to anticipate reasonably foreseeable events that could result in an aircraft mishap. Procedures to resolve or mitigate the impact of these inflight events are central not only to this training but also to the Air

Force flying safety culture. The loss of an engine due to a bird strike or mechanical failure is one example. Simulated flameout approaches are flown in visual conditions with the engine at idle thrust, so the pilot subsequently has the skill and experience to safely recover an aircraft if an actual engine failure were to occur. Under a simulated flameout operation, the aircraft engine is still operating when these practice approaches are flown so thrust can be restored when required. Since 2015, there have been 15 reported F-16 actual flameout events. Of those, all returned safely to the airfield except for one Class A mishap (NGB Safety, 2021).

Under the Proposed Action, the number of operations flown annually with based military aircraft would increase slightly, by 368 operations. Within the SUAs, the total number of sortie hours flown would remain fairly consistent. The aircraft would fly at different altitudes within the airspace used by the 122 FW—use of the JPG MOAs and R-3403 would decrease and the use of Red Hills MOA would be rare. The F-16s would increase their training in the Buckeye/Brush Creek MOAs. The existing and proposed annual sorties and hours within each SUA is included in Table 2-2 in Section 2.1.

Similar to existing flying conditions, the proposed F-16 operations would adhere to all established flight safety guidelines and protocol. The F-16 Class A mishap rate (3.35 per 100,000 flight hours) is higher than the A-10 Class A mishap rate (1.88 per 100,000 flight hours), though the F-16 Class B mishap rate (0.96 per 100,000 flight hours) is lower than the A-10 Class B mishap rate (3.2 per 100,000 flight hours). As previously stated, a direct cause and effect relationship between operational levels and aircraft mishaps is generally inconclusive due to unpredictable hazard factors. When F-16 aircraft were previously stationed at Fort Wayne ANGB, no Class A mishaps involving F-16 aircraft occurred. From 2000-2011, 38 aircraft mishaps occurred in flight by F-16s at the 122 FW, primarily due to bird/wildlife strikes, including 34 Class E mishaps and 4 Class C mishaps (Class E mishaps do not meet other reportable criteria) (INANG, 2011b). While the Proposed Action would result in a minor change in aircraft safety, the proposed conversion from the A-10 to the F-16 would not substantially increase the risks associated with the safety of personnel, Guardsmen, or the general public.

F-16 aircraft carry a small quantity of hydrazine in a sealed canister that is designed to withstand crash impact damage. Hydrazine is a highly volatile and toxic propellant that presents a minor, new safety concern at the installation. It is part of the F-16 emergency power unit and, when used for this purpose, it would not pose a safety hazard. In the event of a Class A mishap involving hydrazine, special procedures are used to manage in-flight emergencies and crashes. The 122 FW would prepare a Hydrazine Response Plan, which would establish procedures for responding and controlling emergency incidents involving hydrazine as well as establish command authority and relationships, off-base mutual air support, and general hazardous materials response procedures. With this response plan, the ANG would be prepared for the hydrazine safety risk proposed under the Proposed Action and would have adequate management and response plans in place to minimize the safety impacts associated with hydrazine.

Chaff and Flare

Under the Proposed Action, chaff and flare would be expended during training operations, but use would remain the same as under the existing conditions. The materials in chaff are generally nontoxic except in quantities significantly larger than those any human or animal could reasonably be exposed to from chaff use. Similarly, the components of flares do not pose an adverse human and

environmental risk at the concentrations in flare use. Safety risks have been examined in other studies and found to be extremely low (ACC, 1997; 2011). The studies determined that all hypothesized safety risks involving chaff and flare use (such as causing clutter to FAA radar, interference with satellite tracking, causing arcing of a power line, potential for accident potential from system malfunction, risk of fire, or injury from falling debris) are either relatively minor or the probability of occurrence is extremely rare so as to render the overall risk inconsequential. The Proposed Action would present no change from the current conditions associated with the safety of chaff and flare deployment.

Effects Considered with Other Proposed Actions

Other reasonably foreseeable actions may increase use of the airspace surrounding Fort Wayne ANGB, particularly future planned improvements to the FWA. Users of the airspace would continue to follow existing plans, protocols, and approvals that promote safe flying. Considered together, the actions would not adversely affect ground safety, but there would be an overall improvement to safety with the Fort Wayne ANGB fire station construction and repair project creating beneficial effects. Collective impacts on safety/aircraft safety would be less than significant.

Alternative B (No Action Alternative)

Under the No Action Alternative, the ground and aircraft safety conditions would remain in their current conditions, comparable to what is described in Section 3.2.2. There would be no change in existing aircraft safety or BASH conditions. Some buildings on Fort Wayne ANGB are currently below ANG safety standards and would remain so, resulting in an adverse effect on safety on the installation.

3.3 AIRSPACE MANAGEMENT

3.3.1 Definition of Resource

Airspace is a national resource supporting a broad spectrum of aviation operations in the national interest. The FAA is responsible for the control and use of the U.S. National Airspace System (NAS). This authority dates to the Federal Aviation Act of 1958 and is addressed in 49 USC 40103, Sovereignty and Use of Airspace. The FAA created the NAS to protect persons and property on the ground, and to establish a safe and efficient operational environment for civil, commercial, and military aviation (Federal Aviation Act, 1958).

DAF defines airspace management as the coordination, integration, and regulation of airspace use within defined dimensions. The objective is to meet military training requirements through the safe and efficient use of available navigable airspace in a peacetime environment while minimizing the impact on other aviation users and the public. There are two categories of airspace or airspace areas: regulatory and nonregulatory. Within these two categories, further classifications include controlled, uncontrolled, special use, and other airspace. The categories and types of airspace are dictated by: (1) the complexity or density of aircraft movements; (2) the nature of the operations conducted within the airspace; (3) the level of safety required; and (4) national and public interest in the airspace. Appendix A, Section A.2 contains background and definitions concerning airspace.

Air Route Traffic Control Center (ARTCC; i.e., controlling agencies) provide ATC service to aircraft operating on Instrument Flight Rules flight plans within controlled airspace. While the FAA provides ATC services and clearances to enter and exit SUA throughout most of the NAS, the approval to

occupy the airspace for a specified period of time comes from the military unit scheduling the airspace, referred to as the "using agency" in FAA Joint Order 7400.10C, *Special Use Airspace*.

3.3.2 Affected Environment

The 122 FW operated the F-16 aircraft out of FWA for 20 years until they were replaced with the current A-10 aircraft in 2011. Fort Wayne ANGB has a long history of working with the FWA ATC. Military training involving the 122 FW A-10 occurs primarily within SUA located in Indiana, Ohio, and Illinois. The controlling agency for Buckeye/Brush Creek SUA, R-3401A, R-3401B, Racer SUA, R-3403A, R-3403B, JPG SUA, and Red Hills SUA is Indianapolis ARTCC. The controlling agency for Twelve Mile and Hill Top SUAs is Chicago ARTCC. The primary scheduling or using agency for Buckeye/Brush Creek SUA is the Ohio ANG's 180th Fighter Wing; 123rd Air Control Squadron is the secondary agency. The 122 FW is the primary scheduler for Twelve Mile SUA, Hill Top SUA, and Red Hills SUA; Atterbury Muscatatuck Training Center is the scheduling agency R-3401A, R-3401B, Racer SUA; and Joint Forces Air Component Headquarters Detachment 2 is primary scheduler for R-3403A, R-3403B, and JPG SUA.

3.3.3 Significance Criteria

Impacts on airspace management would be considered significant in proportion to the degree that the action would affect the airspace environment. Impacts would be significant if an action would impose major restrictions on air commerce opportunities, significantly limit airspace access to a large number of private and commercial users or require major modifications to the existing ATC systems.

3.3.4 Environmental Consequences

Proposed Action (Alternative A)

The number of annual aircraft operations at FWA has remained fairly consistent over the past ten years, ranging between approximately 35,000 and 41,000 total annual operations (ATADS, 2021). This includes air carrier, general aviation, and military operations. In 2019, there were 39,266 total annual operations. The additional 368 operations with the F-16 aircraft under the Proposed Action would be slightly less than a one percent increase as compared to the 2019 operations and well within the capacity that the FWA ATC could accommodate.

As previously discussed, the F-16s were formerly based at FWA. The current aircraft instrument approaches were established when the F-16s were based at FWA; therefore, the current flight procedures are not expected to change. There would be an increase in visual pattern work that the F-16 mission requires, including the simulated flameout approaches. Simulated flameout approaches are flown with the engine operating but with the throttle decreased to idle thrust. These operations would be performed in close coordination with the ATC and terminal radar approach control. Given that the F-16 aircraft were previously based at FWA, and similar patterns were conducted, adverse impacts on airspace management are not expected.

Under the Proposed Action, the 122 FW would continue to use the same SUAs. No changes to the configurations of the SUAs used by the 122 FW would occur, and the controlling and using agencies would remain the same.

Most of the training with the F-16s would occur between 10,000 to 30,000 feet MSL, which is higher than the altitude where most of the A-10 training is conducted. ATCAAs would be used more with the

F-16s; cruise altitudes from Fort Wayne ANGB to training airspace would also be higher, typically between 20,000 and 26,000 feet MSL. With the increase in altitude, the F-16s would increase their training in the Buckeye/Brush Creek MOAs because the mission requires supersonic flight training, which is not an A-10 capability. Supersonic flights are approved in the Buckeye ATCAA over 30,000 feet MSL. F-16s currently conduct supersonic training there.

With the increase in higher altitude flights, scheduling restrictions within ATCAAs would need to be considered during mission planning. The Charlie ATCAA has some scheduling restrictions. This ATCAA has been subdivided so that the airspace can be utilized more efficiently. Only the minimum required time for a planned sortie can be scheduled. To the extent possible, the submission must reflect the actual segmented scheduled times of each mission. In addition, the Charlie ATCAA must only be scheduled in conjunction with the activation time of the Buckeye MOA/ATCAA; the Charlie ATCAA must not be used as a stand-alone SUA (LOA, 2019).

The JPG B MOA has additional restrictions that may also be notable with the F-16 mission. The JPG B MOA is normally scheduled with a maximum altitude of 16,000 feet MSL. A request for 18,000 feet MSL may be submitted; however, approval or denial is normally completed when the aircraft receives a clearance into the MOA airspace. Altitudes above 16,000 feet MSL are not approved when Runway 32 is in use at Indianapolis Airport, except when 18,000 feet MSL has been requested as part of a special operation, such as a large force exercise. In addition, time periods have been identified in the JPG B MOA where there can be heavy or complex traffic that may affect operations in the MOA. Users should be aware that there is a higher probability of reduction or cancellation of airspace during these times (LOA, 2017).

Although SUA restrictions could affect the F-16s more than the A-10 mission, the 122 FW is used to flying within these SUAs and working with the controlling and using agencies. Impacts on airspace management would be less than significant.

Effects Considered with Other Proposed Actions

The increased air traffic from the Proposed Action would require minimal additional effort from ATC. When considered with the other identified reasonably foreseeable airspace projects and projected growth of air traffic, the long-term contribution of the Proposed Action to impacts on airspace management would be negligible because the additional sorties would not substantially add to airspace congestion across the region. Increased air traffic would not limit FAA and ATC capabilities or commercial and general aviation activities; therefore, there would be no expected decline either in ATC's ability to maintain aviation safety or in airspace available for general use. In addition, the Proposed Action would not require the creation or reconfiguration of existing airspaces. Collective impacts on airspace management would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, airspace management would remain comparable to what is described in Section 3.3.2. Impacts on airspace management would be less than significant.

3.4 AIR QUALITY

3.4.1 Definition of Resource

Air quality in a region or area is measured by the concentration of criteria pollutants in the atmosphere. Under the authority of the Clean Air Act, the U.S. Environmental Protection Agency (USEPA) established the National Ambient Air Quality Standards (NAAQS) for criteria pollutants, which are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter equal to or less than ten micrometers in diameter and 2.5 micrometers in diameter (PM_{10} and $PM_{2.5}$, respectively), and lead. NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Air quality is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological air basin, and the prevailing meteorological conditions.

A region or area that fails to meet an NAAQS for any pollutant is classified as being in "nonattainment" for that pollutant. A nonattainment area that subsequently meets NAAQS can be reclassified as a "maintenance" area. Both nonattainment and maintenance areas have more rigorous air regulations and monitoring requirements designed to bring regional air quality into attainment with all NAAQS. Federal actions within nonattainment and maintenance areas must demonstrate either that total direct and indirect emissions are below established *de minimis* levels for each applicable criteria pollutant, or prepare a formal General Conformity Determination, in accordance with the General Conformity Rule (40 CFR Part 93). More detailed regulatory and background information on air quality is included in Appendix A, Section A.3.

The air quality study area considers both the volume of airspace within which changes in flight operations would occur, and the ground-based area on and surrounding Fort Wayne ANGB where construction activities and personnel changes would occur. The study area includes the volume of air around Fort Wayne ANGB and the SUA extending from the ground up to the mixing height, which is the altitude at which the lower atmosphere will undergo mechanical or turbulent mixing. Pollutants that are released above the mixing height typically will not disperse downward and thus will have little or no effect on ground-level concentrations of pollutants. Per 40 CFR 93.153(c)(2), the default mixing height of 3,000 feet AGL is used in this EA. SUA airspace that includes components at or below 3,000 feet include Twelve Mile, Brush Creek, Racer MOA/R-3401A/B Complex, and JPG MOA/R-3403A/B Complex. Fort Wayne ANGB is in Allen County, Indiana, and SUA within the mixing zone includes all or parts of the counties of Bartholomew, Brown, Cass, Decatur, Fulton, Jackson, Jasper, Jefferson, Jennings, Johnson, Miami, Pulaski, Ripley, Scott, Washington, and White in Indiana, and the counties of Adams, Fayette, Highland, Pike, Ross, and Scioto in Ohio.

The floors of Red Hills, Hill Top, and Buckeye MOAs all begin at altitudes greater than 3,000 feet AGL, and so changes within these SUA would not affect air quality and are not within the air quality study area.

3.4.2 Affected Environment

Local Air Quality

The study area includes a large geographical area that is in attainment for all criteria pollutants; however, several counties—Allen, Jackson, and Johnson Counties, Indiana—are subject to

maintenance requirements for the 1997 revoked ozone NAAQS (USEPA, 2021a; USEPA, 2021b). Table 3-2 shows the air quality control regions and attainment statuses by county where each component of the Proposed Action would occur. Since the study area includes several orphan ozone maintenance areas, the General Conformity Rule applies to this action. Per the General Conformity Rule, total direct and indirect emissions of the proposed project are compared to specified pollutant thresholds for which the area is in maintenance/nonattainment to determine whether the action is *de minimis* or requires a full Conformity Determination to ensure regional attainment goals are not hindered. See Appendix A, Section A.3 for background information on the General Conformity Rule.

The Indiana Department of Environmental Management (IDEM) Office of Air Quality is the regulatory authority for sources of air pollution in Indiana. Historically, several counties within the study area were in nonattainment and then maintenance for ozone and $PM_{2.5}$, though these NAAQS have since been revoked. Across the state of Indiana, $PM_{2.5}$ has shown a decreasing trend over the past ten years, with a few upward spikes. Central Indiana, which includes Bartholomew, Brown, and Johnson Counties, exhibited a spike above 12 micrograms per cubic meter in 2019, but the annual mean did not result in an exceedance as it is averaged over three years (IDEM, 2021a). Ozone also peaked across the state in 2018, though only two counties are designated as nonattainment with the 2008 ozone standard and three counties as nonattainment with the 2015 standard, none of which are within the study area (IDEM, 2021b). Four ambient air quality monitoring sites are within the study area, two in Allen County and two in Bartholomew County (IDEM, 2020).

The Ohio Environmental Protection Agency (OEPA) Division of Air Pollution Control is the regulatory authority for sources of air pollution in Ohio. A comparatively small portion of the study area is within Ohio. Violations of NAAQS in 2019 occurred for ozone, lead, and sulfur dioxide, but all outside the study area (OEPA, 2019). Three ambient air quality monitoring sites are within the study area, all in Scioto County (OEPA, 2021).

Section 162(a) of the Clean Air Act affords special protections to some federal lands—such as national parks, national wilderness areas, and national monuments—that are designated as Class I areas. The only Class I area within 300 kilometers (186 miles) of the study area is Otter Creek Wilderness in Monongahela National Forest, West Virginia (40 CFR 81.435). A small portion of the easternmost study area in Scioto, Pike, and Ross Counties under Brush Creek MOA is within 300 kilometers (186 miles) of Otter Creek Wilderness.

Emissions at Installation

The 122 FW does not currently maintain any air permits for the operation of equipment or processes at Fort Wayne ANGB (NGB and 122 FW, 2020). Existing stationary source equipment includes abrasive cleaning equipment, various degreasing and solvent cleaning equipment, natural gas-fired boilers or water heaters, emergency generators, engine testing, munitions firing on the range, and fuel storage tanks. Mobile sources include conventional government-owned and privately-owned vehicles and aerospace ground equipment as well as mission-driven emissions associated with A-10 operations. The most recent stationary source emissions are shown in Table A-4 in Appendix A.

Table 3-2 Air Quality Control Regions and Attainment Statuses in the Study Area

County	Affected Portion of Proposed Action[1]	Air Quality Control Region	Attainment Status
Allen County, IN	Fort Wayne ANGB: based aircraft activity, construction & personnel	Northeast Indiana Intrastate	Orphan Ozone Maintenance [2]
Bartholomew County, IN	Racer/R-3401 Complex	Southern Indiana Intrastate	Attainment
Brown County, IN	Racer/R-3401 Complex	Southern Indiana Intrastate	Attainment
Cass County, IN	Twelve Mile MOA	Wabash Valley Intrastate	Attainment
Decatur County, IN	JPG/R-3403 Complex	Southern Indiana Intrastate	Attainment
Fulton County, IN	Twelve Mile MOA	Wabash Valley Intrastate	Attainment
Jackson County, IN	Racer/R-3401 Complex	Southern Indiana Intrastate	Orphan Ozone Maintenance [2]
Jasper County, IN	Twelve Mile MOA	Wabash Valley Intrastate	Attainment
Jefferson County, IN	JPG/R-3403 Complex	Southern Indiana Intrastate	Attainment [3]
Jennings County, IN	JPG/R-3403 Complex	Southern Indiana Intrastate	Attainment
Johnson County, IN	Racer/R-3401 Complex	Metropolitan Indianapolis Intrastate	Orphan Ozone Maintenance [2,3]
Miami County, IN	Twelve Mile MOA	Wabash Valley Intrastate	Attainment
Pulaski County, IN	Twelve Mile MOA	Wabash Valley Intrastate	Attainment
Ripley County, IN	JPG/R-3403 Complex	Southern Indiana Intrastate	Attainment
Scott County, IN	JPG/R-3403 Complex	Southern Indiana Intrastate	Attainment
Washington County, IN	JPG/R-3403 Complex	Southern Indiana Intrastate	Attainment
White County, IN	Twelve Mile MOA	Wabash Valley Intrastate	Attainment
Adams County, OH	Brush Creek MOA	Huntington (West Virginia)-Ashland (Kentucky)-Portsmouth-Ironton (Ohio) Interstate	Attainment [4]
Fayette County, OH	Brush Creek MOA	Wilmington-Chillicothe-Logan Intrastate	Attainment
Highland County, OH	Brush Creek MOA	Wilmington-Chillicothe-Logan Intrastate	Attainment
Pike County, OH	Brush Creek MOA	Wilmington-Chillicothe-Logan Intrastate	Attainment
Ross County, OH	Brush Creek MOA	Wilmington-Chillicothe-Logan Intrastate	Attainment
Scioto County, OH	Brush Creek MOA	Huntington (West Virginia)-Ashland (Kentucky)-Portsmouth-Ironton (Ohio) Interstate	Attainment [3]

40 CFR 81.29; 40 CFR 81.64; 40 CFR 81.204; 40 CFR 81.216; 40 CFR 81.217; 40 CFR 81.218; 40 CFR 93.153 (c)(2)(xxii); (USEPA, 2021a; USEPA, 2021b)

Notes:

[1] Proposed activities at 3,000 feet AGL or higher are above the default mixing height and, therefore, contribute negligibly to ground-level criteria pollutant emissions. Areas above 3,000 feet are not included in this table.

[2] Allen County, Jackson County, and Johnson County, Indiana, were designated as nonattainment areas then maintenance areas for the 8-hour ozone (1997) NAAQS. This standard was subsequently revoked on April 6, 2015, and these counties are in attainment with the stricter 2008 ozone NAAQS. However, the DC Circuit Court termed these "orphan maintenance areas" in *South Coast Air Quality Management District v. EPA* (2018), ruling that these areas were subject to NAAQS maintenance plan requirements. Therefore, these areas, though in full attainment for all current ozone standards, must still meet conformity requirements for the revoked 1997 ozone standard.

[3] Jefferson and Johnson Counties, Indiana, and Scioto County, Ohio, were designated as nonattainment areas then maintenance areas for the $PM_{2.5}$ (1997) NAAQS. This standard was subsequently revoked on October 24, 2016. The General Conformity Rule does not apply to these former maintenance areas (81 *Federal Register* 58126).

[4] A portion of Adams County, Ohio, was previously designated as being in nonattainment then maintenance for the revoked $PM_{2.5}$ (1997) NAAQS. The Proposed Action is over the portion of Adams County that was in attainment.

Key: ANGB = Air National Guard Base; IN = Indiana; JPG = Jefferson Proving Ground; MOA = Military Operations Area; NAAQS = National Ambient Air Quality Standard; OH = Ohio; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; R = Restricted Area.

3.4.3 Significance Criteria

Clean Air Act, Section 176(c)—General Conformity—requires federal agencies to demonstrate that proposed activities would conform to applicable State Implementation Plans for attainment of NAAQS. Several counties in the study area are within orphan maintenance areas for the 1997 ozone NAAQS, meaning that total direct and indirect ozone emissions must be compared to the ozone maintenance thresholds specified in 40 CFR 93.153(b) to determine if the Proposed Action would be *de minimis*, or if a full Conformity Determination is required. Ozone *de minimis* thresholds are measured by its precursors, volatile organic compounds and nitrogen oxides. All other criteria pollutants are in full attainment with NAAQS, so the General Conformity Rule does not apply to those.

Impacts on air quality were evaluated for whether the alternative would cause pollutant concentrations to exceed one or more NAAQS. Per FAA Order 1050.1F, an alternative that causes pollutant concentrations to exceed one or more of the NAAQS for any of the time periods analyzed, or that increase the frequency or severity of any such existing violations would be significant. Air emissions were estimated using the DAF's Air Conformity Applicability Model (ACAM), Version 5.0.17b (AFCEC, 2021).

3.4.4 Environmental Consequences

Proposed Action (Alternative A)

The Proposed Action would result in short-term, minor air emissions during construction-related activities. Long-term, minor air emissions would result from changes in aircraft and aircraft operations (some criteria pollutants and areas would increase while others would decrease), additional personnel, and increased heating demands in facility space. Implementation of the Proposed Action would not exceed *de minimis* thresholds and, therefore, would have less than significant impacts on air quality.

Emissions would vary year to year depending primarily on level of construction activities and project scheduling. Emissions would be below *de minimis* levels for each year of activity, out into the long-term, steady state emissions associated with operational activities of all proposed facilities, personnel, and F-16 mission training. Long-term, steady-state air emissions with General Conformity applicability are summarized in Table 3-3. See Appendix E for the Record of Non-Applicability (RONA), ACAM report showing record of conformity analysis, and ACAM report showing detailed air conformity applicability background and methodologies for air emissions estimates.

Table 3-3 Steady-State Air Emissions (Calendar Year 2032+)

Pollutant	Action Emissions (ton/year)	General Conformity Threshold (ton/year)	General Conformity Exceedance (Yes or No)
Not in a Regulatory Area			
VOC	0.337	—	—
NO_x	7.841	—	—
CO	-0.458	—	—
SO_x	0.034	—	—
PM_{10}	-0.355	—	—
$PM_{2.5}$	-0.085	—	—
CO_2e	102.4	—	—
Fort Wayne, IN (orphan maintenance area for revoked 1997 ozone standard)			
VOC	-15.367	100	No
NO_x	30.502	100	No
CO	-34.023	—	—
SO_x	2.282	—	—
PM_{10}	-2.884	—	—
$PM_{2.5}$	1.279	—	—
CO_2e	6,448.8	—	—
Jackson Co, IN (orphan maintenance area for revoked 1997 ozone standard)			
VOC	0.224	100	No
NO_x	1.520	100	No
CO	-0.409	—	—
SO_x	-0.109	—	—
PM_{10}	-0.459	—	—
$PM_{2.5}$	-0.239	—	—
CO_2e	-329.9	—	—
Indianapolis, IN (orphan maintenance area for revoked 1997 ozone standard)			
VOC	0.045	100	No
NO_x	0.549	100	No
CO	-0.023	—	—
SO_x	0.005	—	—
PM_{10}	-0.022	—	—
$PM_{2.5}$	-0.004	—	—
CO_2e	16.4	—	—

(AFCEC, 2021)

Key: CO = carbon monoxide; CO_2e = carbon dioxide equivalents; IN = Indiana; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; PM_{10} = particulate matter less than or equal to 10 micrometers; SO_x = sulfur oxides; VOC = volatile organic compounds.

Construction Activities

Construction activities would generate criteria pollutant emissions from equipment needed for site preparation, grading, demolition, asphalt work, concrete work, and general building construction. Emissions would include those emitted directly from construction site equipment, including tractors, loaders, backhoes, graders, dozers, and forklifts; and those emitted indirectly from various diesel-powered heavy delivery trucks and gasoline-powered passenger trucks from construction workers that would travel to and from the site. Heavy, diesel-powered equipment emits all criteria pollutants,

but most notably carbon monoxide and nitrogen oxides, which, combined with volatile organic compound emissions, form ground-level ozone. The weather plays a major role in air quality and can either help increase or decrease the amount of pollution in the air. High temperatures, sun, and longer days are conducive to ozone formation, whereas rain tends to wash pollutants out of the air.

Fugitive dust emissions—including PM_{10} and $PM_{2.5}$—would also occur during construction activities. Fugitive dust occurs directly from vehicles disturbing and suspending particulate matter while operating on unpaved surfaces, or from soil stockpiles on an active construction site. It also occurs indirectly from dust and dirt being brought onto paved surfaces from nonroad construction operations, and then disturbed and suspended as vehicles drive over it. Site preparation and grading activities generally have the greatest potential to generate fugitive dust because excavation, clearing, grading, digging, earthwork, and temporary soil stockpiling are at the highest levels. Appropriate fugitive dust controls would be implemented at individual construction sites to ensure emissions do not leave Fort Wayne ANGB property.

Emissions for construction activities were conservatively estimated using the DAF ACAM. Projects involving minor repairs or interior renovations would generate negligible criteria pollutant emissions (e.g., Project 6, Repair Bldg. 756; Project 7, Repair Small Arms Range; Project 12, Modernize Corrosion Control Facility; Project 13, Repair Fire Suppression Facility; and Project 16, Repair Bravo Arm/De-Arm Pad), with emissions increasing for projects involving site grading and new construction (e.g., Project No. 3, Munitions MX/Storage Complex). Given the relatively small construction footprints and the variable temporal span over which projects would be implemented (2022–2031), short-term combustion and fugitive dust emissions would be minor and unlikely to adversely affect local air quality in and around Fort Wayne ANGB and Allen County. Methodology and emissions from individual construction projects are in the detailed ACAM report in Appendix E.

Aircraft Emissions and Operations

Aircraft operations account for the largest source of air emissions from Fort Wayne ANGB. Changes in air emissions under the Proposed Action would come from the following:

- differences in the emissions profiles of the A-10 and F-16 engines (while emissions vary depending on the fuel flow rate and both engines would produce criteria pollutant emissions, the emissions factors for the double-engine A-10 suggest proportionally higher carbon monoxide and volatile organic compound emissions, compared with the single-engine F-16's proportionally higher nitrogen oxide emissions)
- increase in anticipated local airfield operations with the F-16s, which would be around Fort Wayne ANGB in Allen County
- differences in training altitudes across the 122 FW's SUA (the F-16 is supersonic and would fly more training missions above the mixing height, compared with the A-10 that flies more low-altitude training missions over numerous counties in Indiana and several counties in Ohio)

Overall, with the combination of these factors, volatile organic compounds, carbon monoxide, and PM_{10} emissions would decrease across the region, and nitrogen oxide, sulfur oxide, and $PM_{2.5}$ emissions would increase. Only ozone emissions (measured as volatile organic compounds and nitrogen oxides, which are ozone precursors) within certain areas must demonstrate conformity:

Allen County, which would include all activities occurring at and around Fort Wayne ANGB; Jackson County, which is under a portion of the JPG MOA Complex and the Racer MOA Complex; and Johnson County, which is under a portion of R-3401A/B. The applicable *de minimis* threshold for ozone maintenance is 100 tons per year of either nitrogen oxides or volatile organic compounds; the change in estimated annual aircraft emissions of measured ozone precursors (i.e., nitrogen oxides or volatile organic compounds) would be below this threshold. Though they do not apply, the *de minimis* thresholds for all other criteria pollutants in most maintenance and nonattainment areas are 100 tons per year of any pollutant (see Table A-3 in Appendix A). While the *de minimis* standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, and particulate matter do not formally apply to this action because it is fully in attainment for these criteria pollutants, they demonstrate that the projected long-term changes in air emissions from the Proposed Action would not be regionally significant. Given the relatively minor increases in nitrogen oxides, sulfur oxides, and $PM_{2.5}$, emissions from aircraft, the Proposed Action would not cause any pollutant concentrations to exceed NAAQS. Decreases in volatile organic compounds, carbon monoxide, and PM_{10} would be beneficial to air quality but also not regionally significant. Methodology and emissions from A-10 reductions and F-16 additions at Fort Wayne ANGB and SUA below the mixing height are in the detailed ACAM report in Appendix E.

New Facility Operations

Many of the proposed construction projects require interior alterations of existing space, so no long-term changes in facility heating or cooling requirements would be expected from those activities. Project 3, Munitions MX/Storage Complex; Project 10, Addition to Weapons Release Facility; and Project 15, Fitness Center would require climate control and/or heated water supply. Overall, these facilities would generate negligible long-term emissions of criteria pollutants, namely carbon monoxide and nitrogen oxides. Methodology and emissions from facility requirements are in the detailed ACAM report in Appendix E.

Reestablishing the F-16 mission at Fort Wayne ANGB would require the storage of hydrazine, which is listed as a hazardous air pollutant under the Clean Air Act Amendments (42 USC 7412(b)). Hydrazine would be stored in specialized fuel containers that are loaded as-is onto an F-16 for the emergency power unit. Hydrazine would not be serviced, only stored, at Fort Wayne ANGB. The proposed facility would not generate hydrazine emissions. Personnel handling or in proximity to hydrazine fuel containers would wear appropriate personal protective equipment to protect the eyes, skin, and lungs in the event of a spill, in accordance with all procedures and measures identified in the Hydrazine Response Plan. See discussions in Section 3.2, Safety/Aircraft Safety, and Section 3.10, Hazardous Materials, Solid Waste, and Pollution Prevention.

Personnel Additions

An additional 100 personnel are expected under the proposed mission conversion, with 10 as new full-time additions and 90 present one weekend per month. Increased personnel would increase privately-owned vehicle emissions. Gasoline-fueled cars emit all criteria pollutants, but most notably carbon monoxide. The addition of 10 cars daily and 90 cars monthly would represent a minor increase in localized long-term emissions in Allen County. Methodology and emissions from personnel additions are in the detailed ACAM report in Appendix E.

Sensitive Airsheds

Otter Creek Wilderness is the only Class I air quality area within 300 kilometers (186 miles) of the study area. Given the minor increases in criteria pollutant emissions and its distance, the Proposed Action would have no effect on air quality or visibility within Otter Creek Wilderness.

Effects Considered with Other Proposed Actions

The 122 FW only uses Pike and Steelhead MOAs in Alpena SUA as weather alternates, so potential effects, when considered with other reasonably foreseeable actions, would be minimal. Other projects with close causal relationships include increased aircraft operations from the FWA gateway expansion and possibly from the Amazon warehouse construction, if additional shipping flights are generated at FWA. The master plan projects long-term airport growth, increasing overall aircraft operations at the airport by approximately 20 percent by 2030. Long-term increased aircraft operations would contribute to local and regional criteria and greenhouse gas pollutant emissions from the combustion of fuel.

Other reasonably foreseeable construction projects, particularly for the fire station construction and stormwater improvements at Fort Wayne ANGB and gateway expansion at FWA, as these would be near those needed to support the F-16 conversion, would generate short-term criteria pollutant and fugitive dust emissions while ground-disturbing activities are occurring. Detailed construction timelines and staging are not known at this time for these projects, but each project could involve active construction at varying intensities between approximately 6 and 18 months. Air emissions are based on the size and complexity of the project and whether construction activities would occur on unpaved surfaces. All present and other reasonably foreseeable actions could collectively increase emissions of criteria air pollutants temporarily in and around project sites at Fort Wayne ANGB, but variations in the timing of the projects and the relatively short durations of project-related effects would distribute air quality impacts temporally and geographically. Impacts would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, air quality would remain comparable to that described in Section 3.4.2. The A-10 mission would continue, resulting in no change in aircraft, aircraft operations, construction projects, or personnel additions within the study area. Impacts would be less than significant.

3.5 CLIMATE CHANGE

3.5.1 Definition of Resource

Scientific analyses show that Earth's climate is warming, with linked impacts at the local level such as warmer air temperatures, increased wildfire risks, increased storm activity, and increased intensity in precipitation. There is a direct correlation between fuel combustion and greenhouse gas emissions and the changes in Earth's climate patterns. The Intergovernmental Panel on Climate Change estimates that aviation accounted for 4.1 percent of global transportation greenhouse gas emissions, but scientific research to better understand climate change and impacts caused by aviation are ongoing (FAA, 2020a).

3.5.2 Affected Environment

The Köppen-Geiger climate classification system is the most used climate classification system. It designates climate regions globally and is broadly used in climate change research and modeling. The system derives its classification data primarily from vegetation, which is dependent on the temperature and precipitation of a region. The system divides Earth into five climate zones based on multiple criteria, primarily temperature, and 30 subtypes. The five zones include the following:

- Zone A: tropical or equatorial
- Zone B: arid or dry
- Zone C: warm/mild temperate
- Zone D: continental
- Zone E: polar

Fort Wayne ANGB and the Twelve Mile MOA Complex fall within the Köppen-Geiger 'Dfa' climate category, while the Racer MOAs and R-3403A/B, JPG MOAs and R-3403A/B, and Brush Creek MOA to the south fall within the 'Cfa' climate category (CC&IFD, 2019). Zones C and D are broken into categories based on when the dry season occurs in the zone, as well as the coldness of summer or warmth of winter (Brown, 2019). These areas both experience hot, humid summers and cold winters with no marked difference in precipitation among the seasons.

On average, temperatures across the state of Indiana have increased by about one degree Fahrenheit in the last century. Over the last half century, average annual precipitation in most of the Midwest has increased by 5 to 10 percent. Rainfall during the four wettest days of the year has increased about 35 percent, and the amount of water flowing in most streams during the worst flood of the year has increased by more than 20 percent. Continuation of warming trends could result in varying intensity of extremely hot days, increased heavy springtime precipitation events and flooding events, and increased summertime drought events (USEPA, 2016). The extent and timeline for these kinds of climate effects is the subject of debate among climate scientists.

In agricultural areas of Indiana, longer frost-free days would extend the growing season, but increasingly hot summers could also reduce corn and soybean growth. Heavy, intense rainfall could increase localized flooding. In urban areas, including areas such as Fort Wayne, rising temperatures could intensify formation of ground-level ozone, exacerbating lung and heart problems in sensitive populations (USEPA, 2016).

3.5.3 Significance Criteria

There are no established significance thresholds for greenhouse gas emissions or links between direct actions and climate change. While it is difficult to accurately predict the timing, magnitude, and location of aviation's climate impacts, minimizing greenhouse gas emissions and identifying potential future impacts of climate change are important considerations (FAA, 2020a).

3.5.4 Environmental Consequences

Proposed Action (Alternative A)

Greenhouse Gas Emissions

Implementation of the Proposed Action would contribute directly to emissions of greenhouse gases, namely carbon dioxide, from the combustion of fossil fuels. Short-term emissions would be generated from construction activities over approximately ten years. In the long term, greenhouse gases would be emitted from aircraft operations as well as facility heating and increased personnel at Fort Wayne ANGB (6,238 tons, 5,659 metric tons carbon dioxide equivalents; see methodology and emissions in the detailed ACAM report in Appendix E) (AFCEC, 2021). There are currently no accepted standards to aid in determining significance of greenhouse gas; however, considering the minor effects the Proposed Action is projected to have from criteria pollutant emissions (see Section 3.4.4 for discussion of air quality), the Proposed Action would have proportionally minor contributions to local and regional greenhouse gas emissions. Greenhouse gas emission impacts would be less than significant.

Climate Change Trends

Long-term changes in weather patterns are expected to occur within the Fort Wayne region, such as extended droughts, increase in frost-free days, increased intensity of precipitation, and increased flooding events. Fort Wayne ANGB is not located within the 100- or 500- year flood zones and the nearest river, the St Mary's River, is located approximately three miles east of the installation. Long term impacts from climate change would not be expected to have a significant impact on the Proposed Action.

Effects Considered with Other Proposed Actions

The 122 FW only uses Pike and Steelhead MOAs in Alpena SUA as weather alternates, so potential effects, when considered with other reasonably foreseeable actions, would be minimal. Increased aircraft operations from the FWA gateway expansion and possibly from the Amazon warehouse construction, if additional shipping flights are generated at FWA, would incrementally add to greenhouse gas pollutant emissions from the combustion of fuel. Together, these increased aircraft operations would not be expected to result in noticeable contributions to increases in greenhouse gas emissions.

Other reasonably foreseeable construction projects, particularly for the fire station construction and stormwater improvements at Fort Wayne ANGB and the proposed expansions at FWA, as these would be near those needed to support the F-16 conversion, would generate short-term greenhouse gas pollutant emissions from the combustion of fuel while ground-disturbing activities are occurring. Detailed construction timelines and staging are not known at this time for these projects, but each project could involve active construction at varying intensities between approximately 6 and 18 months. All present and other reasonably foreseeable actions could collectively increase greenhouse gas emissions in and around project sites at Fort Wayne ANGB, but variations in the timing of the projects and the relatively short durations of project-related effects would distribute impacts temporally and geographically. Impacts would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, the Proposed Action would not be implemented, and greenhouse gas emissions generated by 122 FW aircraft and operations would remain at current levels. The A-10 mission would continue, resulting in no change in aircraft, aircraft operations, construction projects, or personnel additions within the study area. Impacts would be less than significant.

3.6 NOISE AND NOISE COMPATIBLE LAND USE

3.6.1 Definition of Resource

There are many sources of noise present in today's communities; however, aircraft noise is readily identifiable based on its uniqueness. An assessment of aircraft noise requires a general understanding of how sound affects people and the natural environment, as well as how it is measured. This analysis includes an assessment of noise from aircraft operations at the airfield, aircraft operations within the primary SUAs that the 122 FW uses, and aircraft weapon expenditures (i.e., release) at Camp Atterbury and JPG.

A noise metric refers to a unit or quantity that measures an aspect of the received noise. A metric is used to relate the received noise to its various effects. To quantify these effects, the DOD uses a series of metrics to describe the noise environment. These metrics range from simple to complex measures of the noise environment.

Day-Night Average Sound Level (DNL) is the primary noise metric used to describe the aviation noise environment around airport environments, per DOD Instruction 4715.13, *DoD Operational Noise Program*. DNL is defined as the average sound energy in a 24-hour period with a 10 dB adjustment (in A-weighted decibels, or dBA) added to nighttime noise events occurring between the hours of 2200 and 0700. DNL is a useful descriptor for aircraft noise because (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. DNL provides a measure of the overall acoustical environment, but it does not directly represent the sound level at any given time.

Onset-Adjusted Monthly Day-Night Average Sound Level (Ldnmr) is the average sound energy in a 24-hour period with a 10 dB adjustment penalty added to the nighttime levels (similar to DNL), and up to an additional 11 dB adjustment penalty for acoustical events with onset rates greater than 15 dB per second, such as high-speed jets operating near the ground. Because of the penalties for rapid onset, Ldnmr is always equal to or greater than DNL. Ldnmr is used to assess noise from aircraft operations in SUA.

The peak pressure level (LPk) is the highest instantaneous, unweighted sound level over any given period. It is used to quantify impulsive, short-duration events such as weapons firing. LPk is used to assess the potential for structural damage and the probability of complaints. High peak sound levels can generate complaints from people in the local community. LPk is used to quantify the use of aircraft munitions.

Maximum Sound Level (Lmax) is the maximum sound level from a single source. It is the highest A-weighted sound level that occurs, for example, during an aircraft overflight or from a piece of construction equipment.

3.6.2 Affected Environment

Airfield

FWA is in a relatively flat agricultural and rural residential area with several industrial warehouse facilities within the airport boundary (INANG, 2011a) and around the airport property. Consequently, the dominant source of noise in the region around FWA is from aircraft operations. These operations include commercial air carriers, air cargo activities, corporate jets, small general aviation aircraft, ANG aircraft, and transient military aircraft (INANG, 2011a). To assess the existing noise environment, aircraft noise modeling was conducted at FWA, including civilian and military aircraft operations. Data were collected from interviews with aircrews, planners, schedulers, and air traffic controllers. Under existing conditions, there are a total of 39,024 annual operations. The existing conditions 65 to 75 dBA DNL noise contours are plotted on an aerial (see Figure 3-2). The 65 dBA DNL contour does not extend more than 4,000 feet beyond the thresholds of each runway. The 65 dBA DNL contour extends the furthest from Runway 14 to northwest of the airport expressway due primarily to A-10 departures on Runway 32. The 65 dBA DNL contour extends off airport property only from Runway 14 and Runway 5. The 70 and 75 dBA DNL contours do not extend off airport property.

FWA is under the city of Fort Wayne zoning jurisdiction and is zoned industrial. Property north and east of the airport is primarily zoned industrial; the land to the west of the airport has sections of industrial, residential, commercial, and agricultural zoning; land to the south has industrial and some agricultural zoning (see Figure 3-5). As shown in Table 3-4, the existing noise contours only encompasses land that is zoned industrial, located to the northwest and southwest of the airport. No property zoned residential, commercial, or agricultural is currently within the 65 to 80+ dBA DNL contours.

Table 3-4 Zoning within Existing DNL Noise Contours Outside FWA

Noise Contours	Residential	Commercial	Industrial	Agricultural
65–69 DNL	—	—	41 acres	—
70–74 DNL	—	—	—	—
75–79 DNL	—	—	—	—
80+ DNL	—	—	—	—
Total	**0 acres**	**0 acres**	**41 acres**	**0 acres**

Key: DNL = Day-Night Average Sound Level; FWA = Fort Wayne International Airport.

Figure 3-2 Existing DNL Noise Contours at FWA

SUA

The SUA analysis was conducted for Twelve Mile/Hill Top SUA, JPG SUA, Camp Atterbury and Racer SUA, Red Hills SUA, Buckeye/Brush Creek SUA, as described in Section 1.3. The existing conditions analysis was conducted with the A-10 aircraft. Baseline operations of other aircraft in the airspace units were modeled with the F-35A for other fighter jets, the C-17 for large/cargo jets, the C-130J for multi-prop cargo jets, the CH-53 for helicopters, and the KC-135R for tankers. Under existing conditions, the noise levels for all the SUA are below 35 dBA DNL and Ldnmr.

The areas below the Twelve Mile MOA Complex and the Hill Top MOA are predominantly rural land, consisting mainly of open space and agricultural with patches of forests adjacent to agricultural lands as well as forests along the creeks and rivers. In addition, there are a few small urban areas under these two MOAs. The Racer MOA is predominantly above the Brown County State Park, which is rural and consists almost entirely of forest land. The area to the east of the park, which is also under the Racer MOA, is more populous with the city of Columbus and its metropolitan area. The area below the JPG MOA is rural and consists of open space, agricultural land, and forest cover. It is much more covered in wooded areas than the northern MOAs. The Buckeye MOA and the Brush Creek MOA are over a heavily forested area, some of which is the Pike Lake State Park. The westernmost area of the Buckeye MOA is primarily agricultural, open land, and forested but much less so than the state park areas. This section also features pockets of town and village centers along transportation routes.

Aircraft Weapons Systems

As discussed in Section 1.3, the A-10 mission operations include weapon systems training activities within RAs. Inert munitions training activities are conducted in RAs at ranges associated with Camp Atterbury Joint Maneuver Training Center and JPG. Noise modeling was conducted for these training activities. The results of the existing analysis are discussed in Section 3.6.4.

3.6.3 Significance Criteria

Airfield

For airport noise, an action would be significant if noise would increase by 1.5 dBA DNL or more for a noise-sensitive area that is exposed to noise at or above the 65 dBA DNL noise exposure level, or if noise would increase by 1.5 dBA DNL or more at or above the 65 dBA DNL noise exposure level when compared to the No Action Alternative for the same timeframe (FAA, 2020a). For example, an increase from 65.5 dBA to 67 dBA DNL is considered a significant impact, as is an increase from 63.5 dBA to 65 dBA DNL. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites. However, noise compatibility or non-compatibility of land use is determined by comparing the aircraft DNL values at a site to the values in the land use compatibility guidelines. To determine specific measures of aircraft noise impacts within the threshold described above, DOD and FAA have adopted the concept of land use compatibility. DOD land use compatibility guidelines are addressed in DOD Instruction 4165.57 (DOD, 2021). Objectives include (1) limiting concentrations of people and facilities or structures in areas exposed to a higher risk from aircraft accidents; and (2) discouraging noise-sensitive land uses in areas of higher noise exposure from aircraft operations. Recommendations in DOD Instruction 4165.57 are intended to support compatible land use planning both on- and off-base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning. See Appendix F

for the DOD land use compatibility table. Land use compatibility guidance for the FAA is outlined in Part 150, Airport Noise Compatibility Planning (14 CFR 150, 2021). These regulations prescribe the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs. These regulations state that in areas where noise levels are 65 dBA DNL or greater, land use compatibility should be determined in accordance with the Part 150 standards. All land uses are considered to be compatible with noise levels less than 65 dBA DNL. Local needs or values may dictate further delineation based on local requirements or determinations. See Appendix F for the FAA land use compatibility table.

SUA

When determining significance from aircraft operations in SUAs, DNL and Ldnmr noise metrics are used to assess impacts. Ldnmr has an 11 dB adjustment for acoustical events with onset rates greater than 15 dBA per second, such as high-speed jets operating near the ground, and is assessed with flying days per month. As a result, Ldnmr is always equal to or greater than DNL. Impacts on noise sensitive receptors are assessed with DNL and Ldnmr using the thresholds and land use compatibility guidance as described in the previous paragraphs.

Aircraft Weapons Systems

Impacts from aircraft weapons system were assessed for probability of noise complaints with LPk. The risk of noise complaints is low for <115 dB LPk, medium for 115 to 130 dB LPk, and high for 130 to 140 dB LPk (Army, 2007). Noise-sensitive land uses are discouraged in areas where LPk is between 115 and 130 dB. Noise-sensitive land uses are strongly discouraged in areas equal to or greater than 130 dB LPk.

3.6.4 Environmental Consequences

Proposed Action (Alternative A)

Aircraft Activity

Noise-producing activities within the airfield and SUA from aircraft flight, as well as within RAs from aircraft weapon training, are described below in further detail. Airfield noise levels in and around FWA would increase, while weapons noise at Camp Atterbury and JPG would decrease. Noise from SUA operations would remain relatively unchanged. Impacts from noise under the Proposed Action would be less than significant as further discussed below.

Airfield

Airfield noise modeling for the Proposed Action included the replacement of the based A-10 aircraft with the F-16. The based and transient military and civilian aircraft flight operations involve a variety of departure, arrival, and closed pattern procedures. The total number of modeled aircraft operations is 39,024 annual operations for existing conditions and 39,392 under the Proposed Action. Figure 3-3 shows the existing conditions and Proposed Action 65 to 85 dBA DNL contours. The Proposed Action DNL contours are wider than the existing contours and extend further out in all areas except along the Runway 14 centerline. This is because the A-10 departs from Runway 32 with 45 percent runway utilization, whereas the proposed F-16 departs from Runway 32 with only 5 percent runway utilization. As shown in Table 3-5, the existing 65 to 80+ dBA DNL contours for the A-10 total about 600 acres and the proposed contours for the F-16 total about 1,465 acres, which is an increase of 865 acres. The biggest increase is within the 75 to 79 dBA DNL contour.

Figure 3-3 Existing and Proposed DNL Noise Contours at FWA

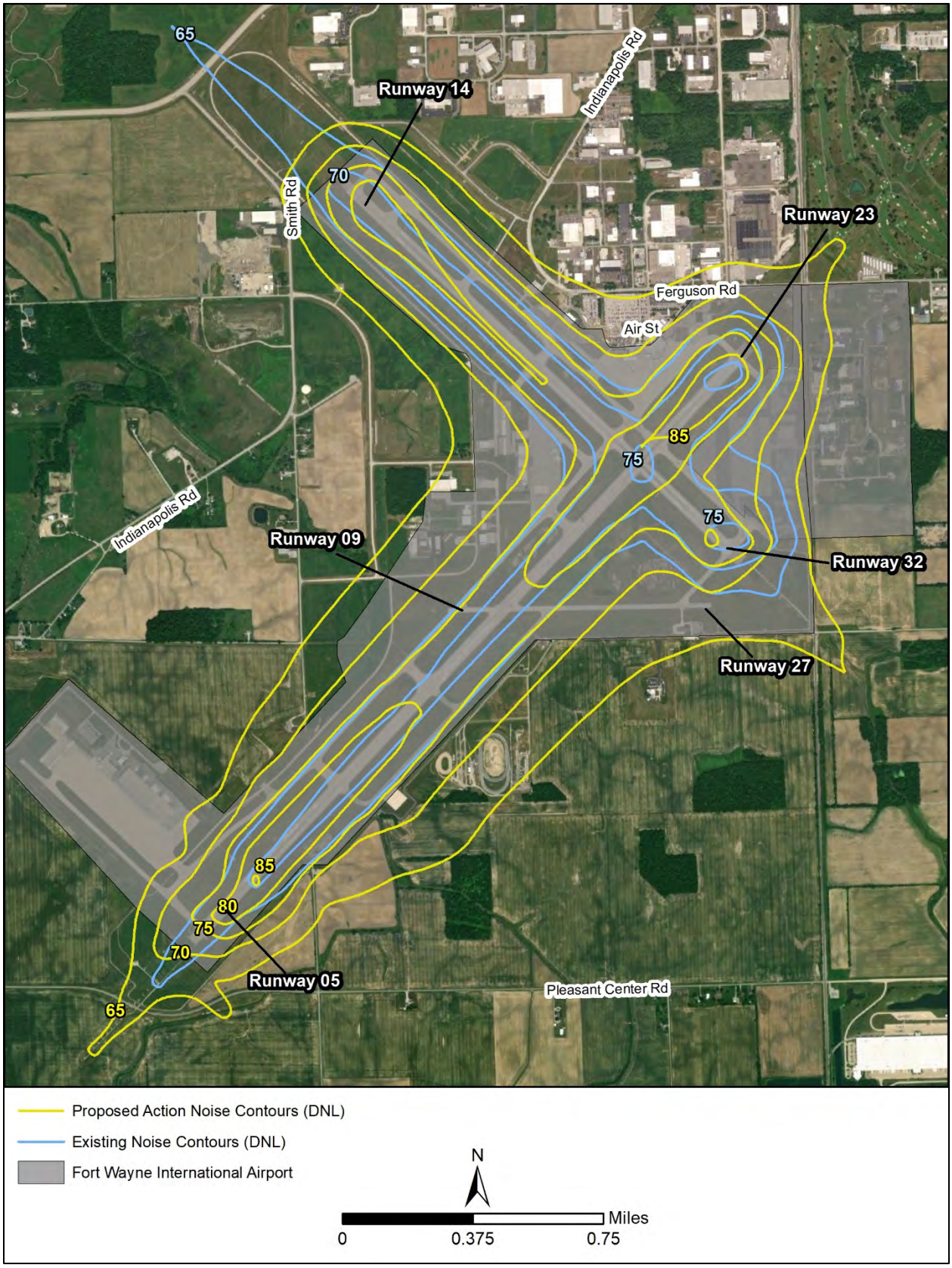


Table 3-5 Existing and Proposed DNL Noise Contours at FWA

Noise Contours	Existing Conditions	Proposed Action	Change
65–69 dBA DNL	349 acres	610 acres	+261 acres
70–74 dBA DNL	239 acres	369 acres	+130 acres
75–79 dBA DNL	12 acres	312 acres	+300 acres
80+ dBA DNL	0	174 acres	+174 acres
Total	**600 acres**	**1,465 acres**	**+865 acres**

Key: dBA = A-weighted decibels; DNL = Day-Night Average Sound Level; FWA = Fort Wayne International Airport.

Points of interest, which represent noise-sensitive land uses, around FWA were chosen to assess noise levels at specific locations. These points of interest are shown in Figure 3-4 and Table 3-6 and include residences, a school, church, town, and parks closest to FWA. Residences located adjacent to Indianapolis Road, west of FWA, would be exposed to a 5 dBA DNL increase under the Proposed Action, but the DNL level is below 50 dBA at this location. The threshold of significance is an increase of 1.5 dBA DNL or more at 65 dBA DNL or above. Residences near Pheasant Run Park would also be exposed to and increase above 1.5 dBA DNL, but the noise level is also below 50 dBA DNL. The only place where the noise is at 65 dBA DNL is the Brookwood Golf Club, which has a noise level of 63 dBA DNL under existing conditions and would increase by 2 dBA to 65 dBA DNL. However, as previously discussed, land use noise compatibility is determined by comparing the aircraft DNL values at a site to the values in the land use compatibility guidelines. Outdoor recreational land uses, such as golf courses, are compatible in the 65 to 69 dBA DNL noise zones as shown in FAA Land Use Compatibility Table F-2 (in Appendix F). Therefore, this would not result in a significant impact.

Table 3-6 Existing and Proposed DNL Values for Points of Interest

Points of Interest	Existing Conditions	Proposed Action	Change
Brookwood Golf Club	63 dBA	65 dBA	+2 dBA
Fox Island County Park	51 dBA	51 dBA	—
Miami Middle School	50 dBA	51 dBA	+1 dBA
Orchard Ridge Country Club	43 dBA	49 dBA	+6 dBA
Residences on Indianapolis Road	44 dBA	49 dBA	+5 dBA
Residences adjacent to Lower Huntington Road	39 dBA	39 dBA	—
Residences near Pheasant Run Park	46 dBA	49 dBA	+3 dBA
Residences on Dunkelberg Road	55 dBA	56 dBA	+1 dBA
Zanesville United Methodist Church	40 dBA	39 dBA	-1 dBA
Trinity Church	51 dBA	55 dBA	+4 dBA
Wayne High School	48 dBA	49 dBA	+1 dBA

Key: dBA = A-weighted decibels; DNL = Day-Night Average Sound Level

In addition to the points of interest that were chosen to assess existing and proposed noise levels at specific locations, Figure 3-4 depicts properties that are listed, eligible, or potentially eligible for listing on the National Register of Historic Places (NRHP) within two miles of the Proposed Action. These properties are further discussed in Section 3.9 and A.14.

Figure 3-5 shows the noise contours for existing conditions and Proposed Action on a zoning map. There is more property affected by higher noise levels outside of the boundaries of FWA under the Proposed Action as compared to existing conditions. As shown in Table 3-7, there are 424 acres of

Figure 3-4 Points of Interest on Aerial Map

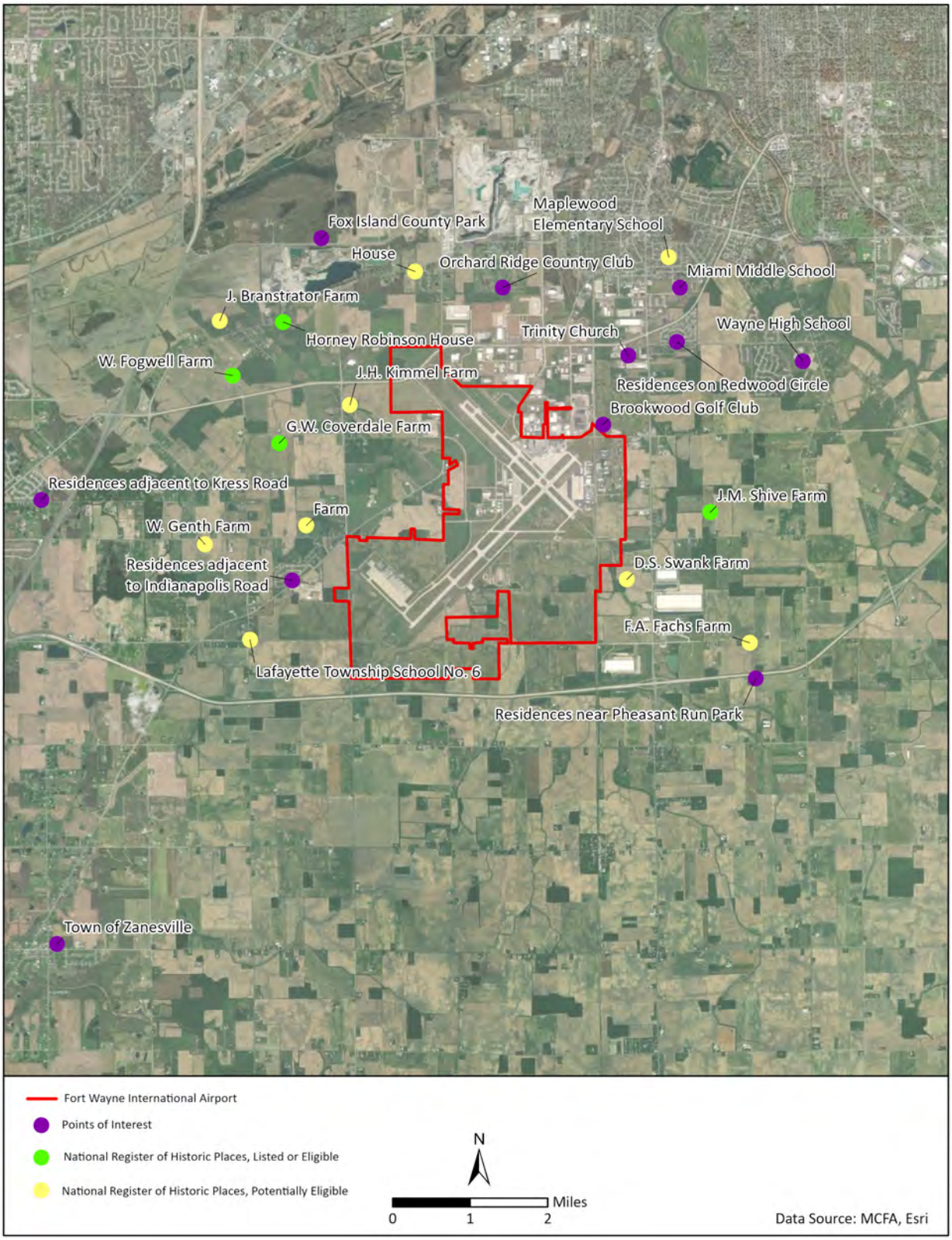


Figure 3-5 Existing and Proposed Action DNL Noise Contours on Zoning Map

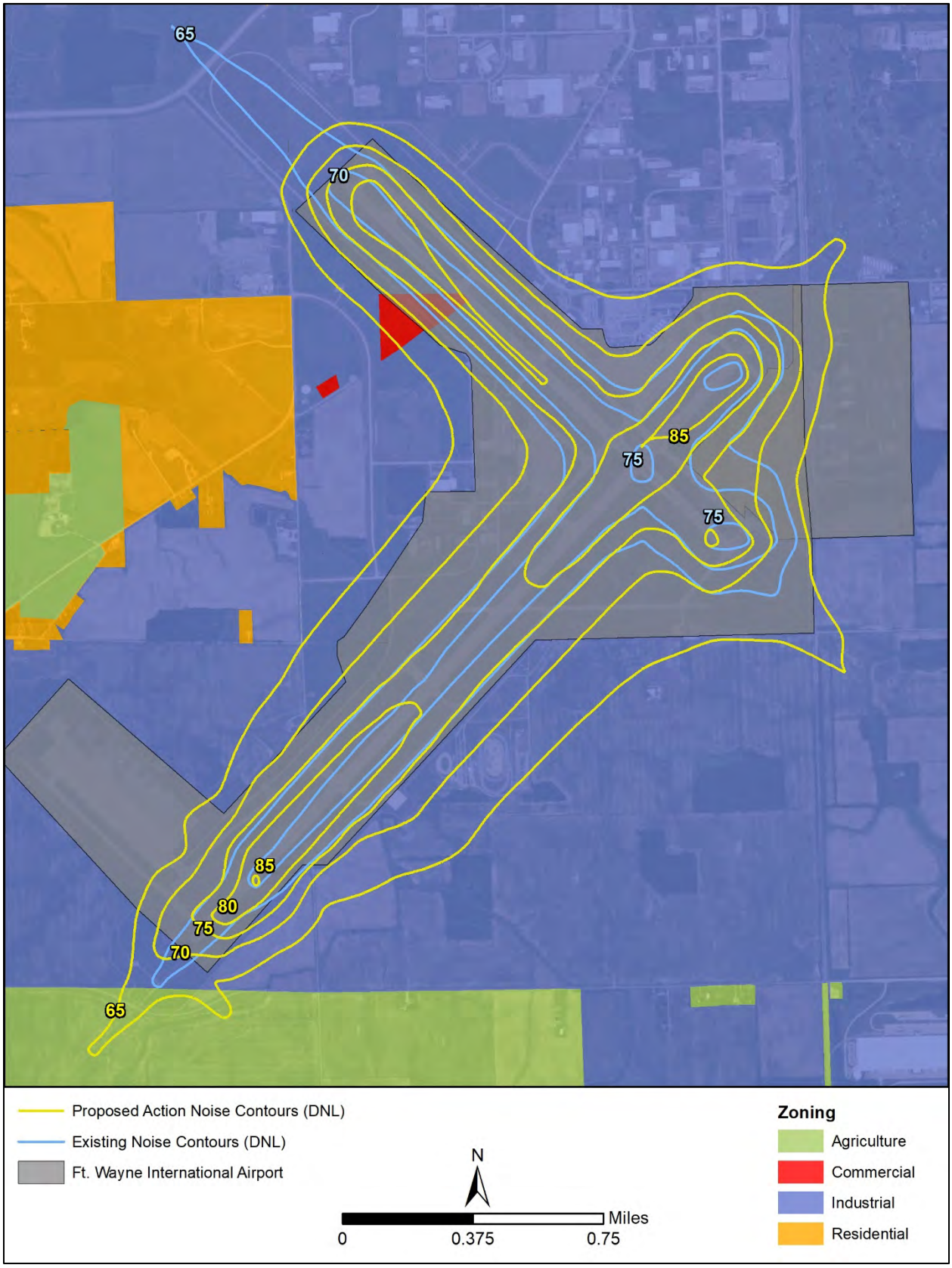


Table 3-7 Zoning Acres within Proposed Action Contours Outside FWA

Noise Contours	Residential	Commercial	Industrial	Agricultural
65–69 DNL	—	6 acres	358 acres	13 acres
70–74 DNL	—	—	63 acres	—
75–79 DNL	—	—	3 acres	—
80+ DNL	—	—	—	—
Total	**0 acres**	**6 acres**	**424 acres**	**13 acres**

Key: DNL = Day-Night Average Sound Level; FWA = Fort Wayne International Airport.

industrial land within the 65 to 79 dBA DNL contours and 13 acres of agricultural land within the 65 to 69 dBA DNL contours. Land use compatibility guidelines state that industrial land is compatible without restrictions within 65 to 69 dBA DNL. Within 70 to 74 dBA DNL, industrial land is compatible; however, it is recommended that measures to achieve a noise-level reduction of 25 dB be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low. Agricultural land and commercial property are compatible within 65 to 69 dBA DNL. Impacts from aircraft noise at FWA would be less than significant.

SUA

As shown in Table 3-8, the DNL and Ldnmr results for existing conditions with the A-10 and the Proposed Action with the F-16 are below 35 dBA. This is because the total sorties are divided among many different airspace areas, and those areas are large enough in size that the daily average noise is dispersed and falls below 35 dBA DNL and Ldnmr. ATCAAs that would be utilized by the 122 FW include the Hill Top ATCAA, JPG ATCAA, Ripley ATCAA, Racer ATCAA, Buckeye ATCAA, Charlie ATCAA, and Red Hills ATCAA. ATCAAs have a floor (the lowest altitude) of 18,000 feet MSL. All the MOAs shown in Table 3-8 have a floor that is lower than 18,000 feet MSL. ATCAAs are located above MOAs, consequently, noise levels within ATCAAs would also be below 35 dBA DNL and Ldnmr.

Table 3-8 Existing and Proposed DNL and Ldnmr Values within SUA

SUA	Existing Conditions	Proposed Action
Twelve Mile East MOA/ Twelve Mile West MOA	<35 dBA	<35 dBA
Hill Top MOA	<35 dBA	<35 dBA
R-3403A/R-3403B	<35 dBA	<35 dBA
JPG A MOA/JPG B MOA, JPG C MOA/ JPG D MOA	<35 dBA	<35 dBA
R-3401A/R-3401B	<35 dBA	<35 dBA
Racer A MOA/Racer B MOA, Racer C MOA/Racer D MOA	<35 dBA	<35 dBA
Buckeye MOA/Brush Creek MOA	<35 dBA	<35 dBA
Red Hills MOA	<35 dBA	<35 dBA

Key: dBA = A-weighted decibels; FW = Fighter Wing; DNL = Day-Night Average Sound Level; Ldnmr = Onset-Adjusted Monthly Day-Night Average Sound Level; MOA = Military Operations Area; R = Restricted Area.

Land underneath the airspace used by the 122 FW consists of rural areas, forested regions, agricultural lands, small- to medium-sized municipalities, and one urban area. The changes in use of the airspace would not preclude existing land uses on the ground. As discussed, the DNL and Ldnmr results for the existing conditions and the Proposed Action in the SUAs are below 35 dBA. Given that the noise levels in the SUAs are well below 65 dBA DNL and Ldnmr, land uses beneath the SUAs are compatible with the existing and proposed aircraft operations. Impacts from aircraft noise in SUAs under the Proposed Action would be less than significant.

As previously discussed, proposed supersonic flights would occur in the Buckeye ATCAA over 30,000 feet MSL. The Buckeye ATCAA is already authorized for supersonic activity (over 30,000 feet MSL) and the 180th Fighter Wing at Toledo Ohio ANG currently controls and trains in the Buckeye airspace. Supersonic activity under the Proposed Action would be minimal (less than 3 percent of the sorties going to Buckeye airspace). Therefore, due to the existing activity and the very low number of proposed supersonic flights, impacts from the Proposed Action would be less than significant.

Aircraft Weapons Systems

Aircraft weapon training activities at RAs would continue with the F-16 mission. Noise modeling was conducted for existing conditions and Proposed Action training activities. As shown in Table 3-9, the LPk noise levels at Camp Atterbury encompass 5,513 acres under existing conditions and 2,218 acres under the Proposed Action for 115 dB LPk, which is a decrease of 3,295 acres. The LPk noise levels at JPG encompass 5,577 acres under existing conditions and 1,704 acres under the Proposed Action for 115 dB LPk, which is a decrease of 3,873 acres. The 130 dB LPk levels also show decreases at Camp Atterbury and JPG under the Proposed Action. Although many of the weapons that are used for training are the same, the A-10s use the 30-millimeter, where the F-16s use 20-millimeter weapons, which is not as loud. As a result, the LPk noise levels are smaller under the Proposed Action. In addition, under the Proposed Action, there would be a reduction of approximately 35,222 annual weapon expenditures (i.e., release). As a result, average noise levels from weapon expenditures would decrease as well.

At Camp Atterbury, populations do not reside within or immediately adjacent to the LPk noise levels. Taylorsville is located east of the range and outside of the 115 and 130 dB LPk levels. The Camp Atterbury facilities are located north of the contours. Similar to the Atterbury Range, JPG is located where there is no development. Populations within New Marion are located to the east of the range and outside the 115 and 130 dB LPk levels from the aircraft weapon expenditures. Impacts from aircraft weapon systems noise under the Proposed Action would be less than significant.

Table 3-9 Existing and Proposed Peak Noise Levels from Aircraft Weapons Systems

Noise Contours	Existing Conditions	Proposed Action	Change
Camp Atterbury			
115 dB LPk	5,513 acres	2,218 acres	-3,295 acres
130 dB LPk	75 acres	37 acres	-38 acres
Jefferson Proving Ground			
115 dB LPk	5,577 acres	1,704 acres	-3,873 acres
130 dB LPk	445 acres	67 acres	-378 acres

Key: dB = decibels; LPk = peak pressure level.

Ground-Based Activity

Noise from construction activities would generate short-term impacts under the Proposed Action. Demolition, construction, and renovation activities would last between 1 to 18 months depending on the project. However, these activities would occur during daytime hours and would be intermittent, as equipment and activities would not occur at one continuous level. Table 3-10 shows typical noise levels at 50 feet from the source of heavy equipment. As shown, noise from construction equipment can range from 74 dBA to 98 dBA Lmax at 50 feet. Overall, noise levels diminish with distance from the active project site. The area surrounding FWA is generally agricultural land with industrial properties and some rural residences. Brookwood Golf Club is approximately 1,000 feet from the small arms range, the closest renovation project that would occur under the Proposed Action. Given that the proposed construction would be located at the installation, populations that are adjacent to the proposed construction would be accustomed to aircraft and industrial noises that produce intermittent, high noise levels. In addition, construction would be short term. No long-term noise would occur from the facility projects above the existing ambient noise environment. Impacts from construction noise under the Proposed Action would be less than significant.

With the proposed increase in personnel, approximately 90 people would be on the installation for the unit two-day training drill that is typically conducted once per month. As discussed in Section A.12, Airport Expressway (the primary access road to the airport) has an average annual daily traffic of over 13,000 vehicles, and West Ferguson Road (the Fort Wayne ANGB access) has an average annual daily traffic of approximately 4,000 vehicles (INDOT, 2020). The addition of 90 personnel reporting one weekend a month for unit training drills would not cause a noticeable increase in noise levels from traffic on the public road systems. Impacts on noise from ground-based activities would be less than significant.

Table 3-10 Construction Equipment Noise Emissions Levels

Backhoe	80 dBA
Concrete mixer	85 dBA
Concrete pump	82 dBA
Dozer	85 dBA
Grader	85 dBA
Loader	85 dBA
Pump	76 dBA
Rock drill	98 dBA
Roller	74 dBA
Saw	76 dBA
Scraper	89 dBA
Shovel	82 dBA
Truck	88 dBA

(Federal Transit Administration, 2006)
Key: dBA = A-weighted decibels.

Effects Considered with Other Proposed Actions

NGB is proposing a modification, expansion, and utilization of the Alpena SUA Complex in Michigan. Occasionally, the 122 FW utilizes airspace outside of their primary SUAs, such as the Pike and

Steelhead MOAs, which are part of the Alpena SUA Complex. However, it is rare that the 122 FW uses these SUAs, and there is currently enough capacity in the SUAs that they currently utilize.

Noise modeling in the *Fort Wayne International Airport Master Plan Study 2012* was completed for annual operations at the airport for 2010 (existing), 2020 (future), and 2030 (future) scenarios. The future scenarios were modeled with 57,903 and 62,780 annual operations, respectively (RW Armstrong, 2012). The total number of annual aircraft operations modeled in this EA is 39,024 for existing conditions and 39,392 under the Proposed Action. As a result, the additional 368 operations under the Proposed Action are well within the future scenarios modeled in Master Plan Study. The Master Plan Study stated that no incompatibility issues due to noise were anticipated.

Planning for the Airport Project Gateway Expansion has been ongoing for years, with the terminal area concept plan completed in 2017. Given this, any increases in additional aircraft operations have been accounted for during this planning process. Considering that the Proposed Action would not result in significant noise impacts, collective noise impacts would be less than significant.

Noise from construction projects around Fort Wayne ANGB could affect surrounding populations, along with the Proposed Action, if they occurred during the same time frame and same general location. However, populations that are adjacent to the installation are accustomed to industrial noises that produce intermittent, high noise levels. In addition, construction would be short term.

Noise from construction of the Amazon Warehouse on Airport Expressway could contribute to the ambient noise environment during building activities, although these impacts would be short term. The new 1,000 full-time jobs could result in noise impacts from personnel traveling to and from the warehouse. However, it is likely that these personnel would move to the general region and would not relocate to one location; therefore, the impacts from vehicle noise would be dispersed. Impacts would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, noise would remain comparable to what is described in Section 3.6.2. No changes in operational noise levels would occur, and no new facilities would be constructed on the installation. Impacts on noise would be less than significant.

3.7 WATER RESOURCES

3.7.1 Definition of Resource

This section describes water resources including watershed and surface water, floodplains, wetlands and waters of the United States, groundwater, and Wild and Scenic Rivers within and around the study area. Definitions for each of these resources is provided in the section below. For purposes of the water resources investigation, the study area includes the limits of the installation as well as the larger watershed, where appropriate.

3.7.2 Affected Environment

This section provides an overview of the natural ecological systems within the project area. As described in Chapter 2, changes to the SUA under the Proposed Action would not change the size or shape of the airspace. The proposed changes would only affect the number of sorties and the type of aircraft flown by the 122 FW. Physical changes to the installation to accommodate the mission change

from A-10 to F-16 aircraft, including the construction and demolition of buildings and roads, do have the potential to affect water resources; therefore, these changes have been carried forward for further investigation.

Watershed and Surface Water

A watershed is a land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean. The study area is located in the St. Mary's Watershed (U.S. Geological Survey [USGS] Watershed Hydrologic Unit Code 04100004). This watershed covers approximately 507,816 acres spanning across Indiana and Ohio, eventually draining into Lake Erie (Allen County Soil and Water Conservation District, 2009).

Locally, as shown on the USGS topographic map (Appendix G, Figure G-1), the study area drains north and east into Harber Ditch, a perennial tributary of the St. Mary's River. There is an ephemeral stream depicted originating on the far northeast corner of the study area flowing east. No other surface water is shown on the topographic map. A review of aerial photography (Appendix G, Figure G-2) shows an open water pond centrally located in the study area but no other obvious water features.

Following the review of background information, a field survey was performed on April 27, 2021, to determine the current extent of waters of the United States including wetlands and any other surface waters present in the study area. The ephemeral stream identified on the topographic map on the northeastern corner of the study area was not observed during the site visit. An ephemeral concrete drainage ditch was observed in the north-central portion of the study area flowing straight north off the installation. The open water pond shown on the aerial photography was confirmed by the field survey. A forested wetland and emergent wetland not identified during the background investigation were also mapped during the field survey. A map of all surface water features on the site is included in Appendix G, Figure G-4. Further discussion of waters of the United States can be found below.

Groundwater

Groundwater comprises the subsurface hydrologic resources of the physical environment and is an essential resource in many areas. Groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Its properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

There are two primary aquifer systems within Allen County: the sand and gravel aquifer system and the bedrock aquifer system (Schmidt, 2009a). The study area is in the Hessen Cassel Aquifer sand and gravel system. This system is characterized by its lack of productivity (i.e., low yields) and occurs confined within glacial till or overlying bedrock. The study area is in the Silurian and Devonian Carbonates bedrock aquifer system (Schmidt, 2009b). This system has varying degrees of thickness of till and unconsolidated sediment deposits from multiple glacial advances from the north, northeast, and east. The varying thickness can range from 30 to 300 feet. Neither aquifer is considered to be sole-source aquifers or Wellhead Protection Area. Sole source aquifers are defined as aquifers that supply at least 50 percent of the drinking water for their service area. The study area is located within the Urban Area Boundary for the city of Fort Wayne. Fort Wayne ANGB receives its potable water from the city of Fort Wayne; the groundwater is not a source of drinking water for the installation (INANG, 2011a).

Waters of the Unites States

In response to growing potential for degradation of national waters, Congress enacted the Federal Water Pollution Control Act Amendments of 1972, known as the Clean Water Act. Congress gave oversight authority to the USEPA to establish the basic structure for regulating the discharge of pollutants into the waters of the United States. Section 404 of the Clean Water Act authorizes the Secretary of the Army to issue permits for the discharge of dredged or fill material into waters of the United States. Section 401 of the Clean Water Act authorizes states to issue Water Quality Certifications for impacts to waters of the Unites States in response to or as part of the issuance of Section 404 permits. Waters of the Unites States includes wetlands.

The U.S. Army Corps of Engineers (USACE) has established a list of criteria within 33 CFR 328 to assist in the identification of "waters of the United States." Per 51 *Federal Register* 41217, the USACE also has the discretion to determine on a case-by-case basis whether or not a particular waterbody is a "water of the United States." Under 33 CFR 328.3(a), waters of the United States are defined as:

1. the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide
2. tributaries
3. lakes and ponds, and impoundments of jurisdictional waters
4. adjacent wetlands

A preliminary review of data from the National Wetland Inventory map showed the same stream feature as depicted on the topographic map in the far northeast corner of the study area. Approximately 3.73 acres of palustrine emergent wetlands are depicted in two areas on the southeast corner of the study area (see Appendix G, Figure G-3). Palustrine emergent wetlands are inland freshwater areas dominated by non-woody vegetation. The open water pond observed on aerial photography is mapped as emergent wetland on the National Wetland Inventory map.

A field survey was performed on April 27, 2021, to determine the present-day extent of waters of the United States including wetlands in the study area. Five aquatic features were identified and mapped within the study area and are identified on Appendix G, Figure G-4. IS-1 is the concrete-lined ephemeral ditch on the north side; OW-1 is the open water pond centrally located in the study area; EW-1 is an emergent wetland on the southeast side of the study area; SW-1 is a drainage swale on the east side of the study area; and FW-1 is a forested wetland north of OW-1.

The ephemeral stream depicted on the USGS topographic map on the northeast corner of the study area was not found during the field survey. Instead, IS-1, a concrete-lined intermittent drainage ditch was mapped originating from a storm sewer and flowing straight north from the center of the northern side of the study area. This drainage ditch collects rainwater via storm sewer inlets and drainage swales throughout the installation. The cement bottom of the channel makes it difficult to distinguish an ordinary high-water mark (OHWM). Since the feature is intermittent in nature, it may be considered a water of the Unites States.

OW-1, the open water pond identified on the aerial photographs, National Wetlands Inventory map, and mapped during the field survey serves to collect stormwater from the southern and eastern sides of the installation. Overflow from the pond is transported to the north via storm sewer and exits into a drainage swale that continues to flow north. No streams with observable OHWMs were identified

flowing to or from the feature. The pond does not appear on the USGS topographic map, nor do any "blue lines" in the vicinity. Since this pond collects and conveys stormwater and does not display an OHWM connection to any perennial or intermittent stream.

An emergent wetland, EW-1, was identified on the eastern border of the study area. The feature was constructed for stormwater detention and is bounded by berms to the north, west, and east. Several storm sewers discharge into the feature from the west, and sheet flow collects from the south. A storm sewer collects water from the feature and discharges to a drainage swale to the north (SW-1) after a short distance underground. No OHWM was identified in the SW-1 drainage swale and storm water then enters the underground storm sewer system several times before discharging off-site via IS-1. EW-1 is not directly abutting or adjacent to any perennial or intermittent stream and is not connected to a traditionally navigable water via OHWM.

An ephemeral drainage swale, SW-1 flows north from the outlet of the storm sewer from EW-1. The swale has no OHWM and discharges into another storm sewer below ground. SW-1 is a drainage ditch constructed in uplands to transport rainwater during storm events. SW-1 is an ephemeral system that does not display any OHWM.

FW-1 is a forested wetland located north and west of OW-1. The area appears to have been disturbed, and grading in the area left a low spot where rainwater could collect without the opportunity to drain. Cottonwood trees dominate the forest layer. Very little herbaceous vegetation was observed, and standing water was present during the field survey. No stream features were identified adjacent to or abutting the forested wetland.

The USACE written jurisdictional determination will also describe the other aquatic features identified within the study area as wetlands, based on the USACE review of the site as stormwater management features, not jurisdictional waters of the United States. These aquatic features are described above and identified on Appendix G, Figure G-4.

Floodplains

Under 42 USC Section 4001 et seq., the Federal Emergency Management Agency (FEMA) is granted the authority to manage the National Flood Insurance Program (NFIP), which consists of three components: flood insurance, floodplain management, and flood hazard mapping. FEMA publishes Flood Insurance Rate Maps (FIRM) depicting the locations of the 100-year and 500-year floodplain boundaries. NFIP data are available for Allen County; there are no mapped 100- or 500-year floodplains within the boundaries of the study area. The nearest floodplain is approximately 0.5 miles north, east, and south of the study area. A figure showing the FEMA flood hazards in the vicinity of Fort Wayne ANGB is show in Appendix G, Figure G-5.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with characteristics that provide special natural, cultural, or recreational value. Section 2(a)(ii) of the Wild & Scenic Rivers Act allows the Secretary of the Interior to designate a river if a state governor requests designation, however more commonly, Congress designates most rivers into the National Wild and Scenic Rivers System. No rivers in Indiana are designated as Wild and Scenic Rivers.

The State of Indiana maintains a list of Salmonid Streams in 327 Indiana Administrative Code (IAC) 2-1-1.5-5(a)(3). The Harber Ditch/St Mary's River is not listed as a Salmonid Stream, and there are no Salmonid Streams located in or adjacent to the project area. The Harber Ditch/St Mary's River are not listed as an outstanding state resource waters as described in 327 IAC 2-1.5-19(b), nor are they listed as a natural, scenic, and recreational stream under 312 IAC 7-2.

3.7.3 Significance Criteria

Evaluation criteria for potential impacts on water resources are based on water availability, quality, and use; existence of floodplains, wetlands, or other sensitive water bodies; and associated regulations.

Impacts on water resources would be considered significant if the action would do one or more of the following:

- adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers
- substantially alter the hydrology needed to sustain the affected wetland system's value and functions or those of a wetland to which it is connected
- substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety, or welfare
- adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands
- promote development of secondary activities or services that would cause the circumstances listed above to occur
- be inconsistent with applicable state wetland strategies
- cause notable adverse impacts on natural and beneficial floodplain values
- exceed water quality standards established by federal, state, local, and tribal regulatory agencies
- contaminate public drinking water supply such that public health may be adversely affected
- exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies
- contaminate an aquifer used for public water supply such that public healthy may be adversely affected

3.7.4 Environmental Consequences

Proposed Action (Alternative A)

None of the proposed construction activities would affect the wetlands, surface water, or groundwater features identified within the study area. Proposed construction activities are not located near observed surface waters including both jurisdictional and non-jurisdictional wetlands. Site-specific plans detailing erosion and sedimentation controls and best management practices during construction would minimize potential for indirect short-term construction-related impacts on water resources including any impacts on groundwater. Increases in impervious surface from proposed construction and renovation could affect runoff flow and groundwater infiltration. As detailed plans of the proposed construction are developed and finalized, design aspects would determine the stormwater runoff requirements as required under Section 438 of the Energy

Independence and Security Act, if warranted, to preserve the pre-project hydrology. Impacts from the Proposed Action on water resources would be less than significant.

Under the Proposed Action, chaff and flare would be expended during training operations, but use would remain the same as under existing conditions. The components of flare (magnesium oxide, magnesium chloride, and magnesium fluoride) do not pose an adverse risk to human or environmental health at the concentrations experienced in flare use (ACC, 1997). Flares burn almost completely to ash during use, and dud flares are highly unlikely. In addition, chaff released in airspace above aquatic environments on a regular basis has not been found to adversely affect aquatic resources (ACC, 2011); therefore, impacts from chaff activities would be less than significant. Under the Proposed Action, there would be no change (quantity or location) in the use of chaff and flare; therefore, no impact on water resources is anticipated from chaff and flare deployment.

Effects Considered with Other Proposed Actions

Other actions with close causal relationships that involve ground disturbance and construction have the potential to affect surface water, groundwater, wetlands, or floodplains, but the Proposed Action would not collectively contribute to significant impacts on these water sources. The projects outside of Fort Wayne ANGB boundaries would be subject to separate permitting regarding any potential construction impacts on water resources, and are separated from the Proposed Action and unlikely to impact the water resources on the installation. The fire station construction is located on the developed area of the installation, away from the mapped surface water features. The installation stormwater improvement project would improve water collection and retention on the installation and, therefore, would provide beneficial effects to this resource. The proposed stormwater improvements will undergo separate NEPA analysis once the scope and design of the project are established and will consider potential impacts on installation water resources at that time. The stormwater improvements would adhere to all required permitting if impacts to wetlands or water resources is anticipated. Since the Proposed Action is not located near observed surface waters and would therefore not contribute to a collective impact on installation water resources, impacts would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, water resources would remain the same as those described in Section 3.7.2. No ground disturbing activities would occur with continued use of the Fort Wayne ANGB in its current configuration.

3.8 BIOLOGICAL RESOURCES

3.8.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur. These include vegetation; wildlife; and threatened, endangered or sensitive species in a given area. Biological resources are integral to ecosystem integrity. The existence and preservation of biological resources are intrinsically valuable to society for aesthetic, recreational, and socioeconomic purposes. For purposes of biological resources, the study area is the limits of the installation as well as the larger ecological region, where appropriate.

3.8.2 Affected Environment

Vegetation

The study area is located in the Clayey, High Lime Till Plains IV Ecoregion (USEPA, 2012). This ecoregion is described as having rolling glacial till plains broken up by moraines (Woods, Omernik, Brochman, Gerber, & Azevedo, 2021). Historically, the region was covered in beech forests and elm-ash swamps (Woods, Omernik, Brochman, Gerber, & Azevedo, 2021). Presently, most of the of the ecoregion has been modified for agriculture with only fragments of the natural forests remaining.

Aerial photography (Appendix G, Figure G-2) and Level IV Ecoregion descriptions were used to perform a preliminary assessment of vegetation communities likely present in the study area. The desktop evaluation was then verified during the field investigation performed on April 27, 2021. Though the Hill Lime Till Plains IV Ecoregion was historically covered in forests, most of the area surrounding the study area has been converted to cropland.

Though some open spaces and vegetation were observed within the study area during the field survey, no natural vegetation communities remain since the whole of the installation has been converted for ANG use. Most of the installation not covered by impervious surface or buildings is maintained turf with some herbaceous weeds. Grass species observed included Kentucky bluegrass (*Poa pratensis*) and fescue (*Festuca* sp.), with some dandelion (*Taraxacum officinale*) and clover species (*Trifolium pratense* and *T. repens*). A few stands of trees, including sycamore (*Platanus occidentalis*), shagbark hickory (*Carya ovata*), and pin oak (*Quercus palustris*), were also observed with the herbaceous layer below frequently mowed. Cottonwood trees were the dominant species observed in the forested wetland. The southern portion of the study area is currently being used as cropland.

Indiana Department of Natural Resources maintains a list of invasive and noxious species as required in their Terrestrial Plant Rule (312 IAC 18-3-25). Three invasive plant species were observed during the field survey of the study area: Garlic mustard (*Alliaria petiolate*), common teasel (*Dipasacus fullonum*), and johnsongrass (*Sorghum halepense*). Garlic mustard and common teasel are listed as invasive, and johnsongrass is listed as a noxious weed.

Wildlife

Most of the study area is surrounded by security fencing and is utilized as an airport and military installation with high levels of human activity. The fence prohibits most wildlife from accessing the installation. Wildlife that would access the study area are typically those species that tolerate high levels of human activity and disturbance such as Virginia opossum (*Didelphis virginiana*), groundhogs (*Marmota monax*), eastern chipmunks (*Tamias striatus*), and striped skunks (*Mephitis mephitis*).

Wildlife observed during the April 27, 2021, field survey was found near the drainage basin in the northeastern corner and the retention ponds in the southeast. Species observed included red-wing blackbird (*Agelaius phoeniceus*), Canada goose (*Branta canadensis*), killdeer (*Charadrius vociferus*), American woodcock (*Scolopax minor*), and groundhog. Mallard ducks (*Anas platyrhynchos*) were heard nearby, raccoon (*Procyon lotor*) tracks and crayfish burrows were also observed.

Migratory Birds

Migratory birds, as listed in 50 CFR 10.13, are ecologically and economically important. The Migratory Bird Treaty Act (MBTA) of 1918 (Public Law 65-186; 16 USC Section 703 et seq.) prohibits take of migratory birds, their nests, eggs, parts, or products without the appropriate permit and provides enforcement authority and penalties for violations.

The study area is located in the Mississippi and Atlantic flyways, two of four migratory flyways over the United States (Lincoln, Peterson, & Zimmerman, 1998). Both flyways are most heavily utilized during the spring and fall migrations. According to the USFWS IPaC database (accessed on February 3, May 9, and September 2, 2021), there are two migratory birds listed as USFWS Birds of Conservation Concern for the study area: bobolink (*Dolichonyx oryzivorus*) and red-headed woodpecker (*Melanerpes erythrocephalus*).

The 122 FW has developed a BASH Plan to provide guidance on minimizing bird/ wildlife-aircraft strikes. It details several measures used on the installation to minimize migratory birds use of the installation including vegetation management, controlling pests, eliminating standing water, eliminating roosting sites, and bird-proofing buildings and hangars (INANG, 2017a). As mentioned above, some bird species were observed during the field investigation including mallard ducks, Canada geese, red-winged blackbirds, and American woodcock.

Bald and Golden Eagles

The Bald and Golden Eagle Protection Act of 1940 (Public Law 87-884; 16 USC 668a-d) prohibits the taking or harming (i.e., harassment, sale, or transportation) of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their eggs, nests, or young, without appropriate permit. In general, eagles (both bald and golden eagles) are recognized as one of the more hazardous wildlife species for aircraft operations by the FAA (Kelley, Harriott, & Southerland, 2009).

According to National Bald Eagle Management Guidelines (USFWS, 2007), bald eagles in Indiana begin nesting in December. Egg laying and incubation occurs in February, hatching in March, and fledging of young is completed by June. Since bald eagles are piscivores, they typically nest in tall snags or cliffs near large waterbodies. No bald eagle nests or habitat exists within the limits of the installation and as mentioned above for migratory birds, active measures are taken to prevent its use by birds including eagles.

Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 was enacted to "conserve threatened and endangered species and the ecosystems on which those species depend." The USFWS has legislative authority to list and monitor the status of species whose populations are considered imperiled. Regulations supporting this Act are codified and regularly updated in 50 CFR Section 17. A discussion of federal-listed species found within the project boundaries as well as a separate discussion of federal-listed species with potential of occurring are included below.

The state of Indiana maintains a list of threatened and endangered species, which they define as "any animal species whose prospects for survival or recruitment within the state are in immediate jeopardy and are in danger of disappearing from the state" (Indiana Code 14-22-34-1).

An official list of federal threatened and endangered species for the study area was obtained from the USFWS via IPaC on February 3, May 9, and September2, 2021. The Indiana Natural Heritage Data Center is a continuously updated database of existing occurrences for federal- and state-listed endangered, threatened, or otherwise significant natural ecosystems, species, and landscape features in the state. This database was queried on April 16, 2021, to determine if there were any species occurrences within a half mile of the study area.

Table 3-11 lists the species identified by the above USFWS IPaC and the Indiana Natural Heritage Data Center as having the potential to occur within the study area boundary. See Appendix B for further coordination with USFWS and the Indiana Natural Heritage Data Center. Site surveys were performed on April 27, 2021, to further identify potential habitat for federal- and state-listed species.

Table 3-11 Potential Federal- and State-Listed Threatened and Endangered Species within Study Area

Species	Federal Status	State Status	Description of Preferred Habitat	Potential to Occur
Indiana bat *(Myotis sodalis*)	E		Hibernation occurs in caves and mines, with swarming in surrounding wooded areas. Summer roosting and foraging habitat occurs in wooded stream corridors and in bottomland and upland forests and woods.	None
Northern long-eared bat *(Myotis septentrionalis)*	T		Hibernation occurs in caves and mines, with swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods.	None
Monarch butterfly (*Danaus plexippus*)	C		Adult butterflies forage on a variety of flower species. Eggs are laid on milkweed plant (primarily *Asclepias* spp.).	Unlikely
Eastern massasauga rattlesnake (*Sistrurus catenatus*)[1]	T	E	Wetlands, marshes, low areas around river, lakes, and adjacent uplands. Mix of sun and shade for foraging and basking. Hibernation occurs in rock crevices, crayfish burrows, or old stumps.	Yes

(USFWS, 2021; Davis, 2021)
Key: C = Candidate; E = Endangered; T = Threatened.
Notes:
[1] Eastern massasauga rattlesnake was not listed by the USFWS as a species with potential to occur in the study area. It was included in the Indiana Natural Heritage Data Center database review as having occurred in the vicinity of the study area over 40 years ago.

The habitat of the Northern long-eared bat includes caves, mines, and wooded areas. There is no habitat at FWA that supports the Northern long-eared bat.

Monarch butterflies are dependent upon the milkweed plant (primarily *Asclepias* spp.) to lay their eggs, and adult butterflies forage on a variety of flower species. Since the majority of the project area is maintained grassland that is frequently mowed, milkweed would not likely be found.

The eastern massasauga rattlesnake appeared on the Indiana Natural Heritage Data Center list as an occurrence within a half mile of the study area over 40 years ago; however, it was not identified on the USFWS IPaC search as having the potential to occur in the study area, nor is the study area identified by USFWS as Tier 1 or Tier 2 habitat for the species. The occurrence for this species was documented in 1973 at Baer Field Motorsports Park southwest of the study area. Wetlands and water features were observed on Fort Wayne ANGB during field investigations performed on April 27, 2021. Crayfish burrows were also observed, which are known sources of shelter for hibernation as well as providing a dietary resource for eastern massasauga rattlesnake (IDNR, 2021). The installation has the potential to provide habitat for the eastern massasauga rattlesnake (its preferred habitat is described in Table 3-11), and the species may be found in the study area.

3.8.3 Significance Criteria

The impacts on biological resources would be adverse if a species or habitats of high concern are adversely affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern. As a requirement under the ESA, federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid "taking" federally threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a federal agency project.

Impacts on biological resources would be considered significant if the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat.

3.8.4 Environmental Consequences

Proposed Action (Alternative A)

The following discusses potential impacts on vegetation, wildlife including migratory birds, and threatened and endangered species. Impacts on biological resources would be less than significant.

Vegetation

Ground-disturbing activities associated with construction, renovation, and demolition are limited to areas that have been previously disturbed, modified with impervious surfaces, or landscapes that are regularly maintained. Flare expenditures present a small risk for fires due to the extremely high temperatures at which flares burn upon ignition. Fires can have a wide range of environmental effects, including destroying surface vegetation. However, the number of chaff and flare expenditures are expected to remain the same under the Proposed Action and military personnel would continue to follow existing precautions. Therefore, impacts on vegetation would be less than significant.

Wildlife and Migratory Birds

Since wildlife, and especially migratory birds, pose a safety risk when found close to airports, and as noted in the BASH Plan, FWA has taken steps to make the airport less desirable for wildlife and bird use. Vegetation is closely maintained, standing water is minimized, and multiple deterrents are used to discourage use of the facility. Security fencing surrounding most of the study area further discourages wildlife use of the area. By design, the study area provides very poor wildlife habitat, and construction activities are not anticipated to adversely affect wildlife or migratory birds.

The SUA utilized by the F-16s would be the same as what supports the current A-10 training. The F-16s would typically train between 10,000 and 30,000 feet MSL, which is higher than the current A-10 training altitudes. Though variation exists among species, most birds fly below 500 feet AGL, except during migratory flights (Ehrlich, P., Dobkin, D., & Wheye, D., 1988). Approximately 95 percent of bird migration flights occur below 10,000 feet AGL, with the majority below 3,000 feet AGL (Lincoln, Peterson, & Zimmerman, 1998). Since the F-16s would generally train at higher altitudes than the A-10, this could result in potentially fewer impacts to migratory birds, including bald eagles, as compared to existing conditions.

Considering the change in the airframe and the number of operations under the Proposed Action, impacts from noise on birds and wildlife was assessed. As previously discussed, the F-16 mission would utilize the same flight procedures and training airspace as the current A-10 mission. Although the F-16 aircraft typically produce higher single event noise levels than the A-10, wildlife are already accustomed to aircraft noise at the airport. As shown in Table 2-1, the number of operations at the airfield would increase by approximately one operation per day; as a result, adverse impacts to birds and wildlife are not expected at the airfield.

As shown in Table 2-2, there would not be a large increase in the number of sorties or hours within the SUAs except for the Buckeye/Brush Creek MOAs. To assess the impacts to birds and wildlife, aircraft sorties below 3,000 ft AGL were estimated. Between 500 to 5,000 feet AGL there would be an increase in F-16 sorties of approximately 65 per year under the Proposed Action. If the F-16s fly 260 days per year, this equates to less than one sortie per day and each sortie would only last about 30 minutes. Given that birds and wildlife are already accustomed to aircraft training in this area, the noise from the additional aircraft sorties is not expected to result in adverse impacts.

A study on the environmental effects of air defense countermeasures concluded that chaff and flare activities were not shown to have an adverse effect wildlife in areas they were performed (ACC, 2011). Toxicology studies on flare residual materials showed no chemical effects on biological resources, including wildlife. The amount of magnesium dispersed from flares was too small to result in toxicity, and the concentration of flare ash residue at any location is undetectable under normal circumstances due to the dispersal produced by burning in the airspace. Under the Proposed Action, there would be no change (quantity or location) in the use of chaff and flare. No impact on wildlife or migratory birds is anticipated from chaff and flare deployment.

Threatened and Endangered Species

No effects on any federal- or state-listed threatened or endangered species are anticipated as a result of the Proposed Action. There is unlikely to be habitat to support monarch butterfly eggs within the study area, since the project area is primarily maintained grassland that is frequently mowed. Due to

the highly mobile nature of adult monarch butterflies, the Proposed Action would likely have no adverse effect on this candidate species. Though an occurrence for the eastern massasauga rattlesnake was identified within a half mile of the study area, it was over 40 years ago, and the study area was not identified by USFWS as Tier 1 or Tier 2 habitat for the species, nor was it mapped within the species' range. None of the proposed construction activities would affect the observed wetlands, so no effect on this species is anticipated as a result of the Proposed Action.

Effects Considered with Other Proposed Actions

Airspace actions with close causal relationships are not expected to produce a noticeable increase in noise that would affect wildlife within the overall region. Effects on wildlife and their habitats beneath the current SUA would be negligible, and not measurably different when compared to existing conditions. Actions that involve ground disturbance and construction would have the potential to affect biological resources through disturbance and conversion of vegetation and habitat. The Proposed Action would not reduce the distribution or viability of species or of critical habitats. The proposed construction projects would occur within previously disturbed areas that support no native habitat. Due to the sparse presence of natural or native biological resources of any kind on the project sites under the Proposed Action, the impacts on biological resources would not contribute to any collective impacts resulting from other actions on Fort Wayne ANGB or the local area. Impacts would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, biological resources would remain the same as those described in Section 3.8.2. No ground disturbing activities would occur with continued use of the Fort Wayne ANGB in its current configuration.

3.9 HISTORIC PROPERTIES

3.9.1 Definition of Resource

Historic Properties include any precontact or historic district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Traditional Cultural Properties play a significant role in the identity of a community. These typically relate to cultural practices, traditions, and/or belief systems. Traditional Cultural Properties are rooted in a community's history and are important in maintaining the continuing cultural identity of the community.

3.9.2 Historical Context

In January 1941, the War Department selected Fort Wayne as the location of an Army airfield. This airfield became known as Baer Field Army Air Base, and it was tasked to support and train fighter and bomber units for overseas deployments. By the end of World War II, Baer Field encompassed 1,000 acres and included several hundred buildings (TEC, Inc., 2009). The headquarters of the 122nd Fighter Group were transferred to Baer Field in December 1953, and the remaining support units transferred in 1954.

3.9.3 Affected Environment

This section draws from analysis and surveys completed and documented in a Cultural Resources Survey prepared by TEC (TEC, Inc., 2009). Currently, Fort Wayne ANGB has an Integrated Cultural

Resources Management Plan waiver that is set to expire in 2023 (NGB, 2018a). The NGB determined that, at the time of the previous inventory, none of the buildings surveyed and recorded were eligible for inclusion in the NRHP. An Area of Potential Effect (APE) for archaeological and built resources includes the proposed project construction boundaries, all areas of disturbance, and extends around the runways to the proposed 65 dBA DNL contour, as shown on Figure 3-5, all within Fort Wayne ANGB.

No archaeological sites have been identified within the project area. An archaeological survey was conducted throughout the entire cantonment area in 2008. All open space within the installation were surveyed. (TEC, Inc., 2009). Shovel tests excavated during the survey demonstrated that the open spaces within the cantonment area have been disturbed and, in many places, also contain fill brought in from outside. No additional archaeological work was recommended. The Indiana State Historic Preservation Office (SHPO) concurred with that recommendation in a letter dated December 3, 2009 (included in Appendix B).

No historic properties are located within the APE. An architectural survey of Fort Wayne ANGB was completed in 2009 (TEC, Inc., 2009). The survey inventoried and evaluated all above-ground buildings and structures constructed before the end of the Cold War (prior to 1990). NGB determined that Buildings 734, 753, 756, 758, 764, and 780, which are included in the current action, were not eligible for inclusion in the NRHP. The Indiana SHPO concurred in a letter dated December 3, 2009 (TEC, Inc., 2009). The remaining buildings included in this project, Buildings 732, 786, 790, and 800, were constructed after 1990 and not included in the 2009 survey. These buildings do not meet NRHP eligibility requirements. The additional infrastructure components (Runway 5/23, Parking Apron [built 1966], Bravo pad, fitness track) that are proposed for construction or renovation as part of this EA were not surveyed. There are no historic properties within the APE surrounding the runways.

Since the 2009 architectural survey of ANG, one resource, Building 756 (built in 1974), included in this project has turned 45+ years of age. One additional resource associated with this project, Building 764 (built in 1977), will turn 45+ years of age prior to its planned addition.

The NGB and 122 FW consulted with federally recognized tribes who have stated interest or historic ties to the area. None of the tribes consulted expressed a concern with the proposed action, and none identified any locations of cultural or spiritual significance. Copies of the consultation letters and responses are included in Appendix B.

3.9.4 Significance Criteria

Significant effects to historic properties or significant tribal resources would occur from the physical alteration, damage, or destruction of all or part of a resource. Further, significant indirect impacts could occur from alternations to characteristics of the surrounding environment that contribute to the importance of a resource, such as altering visual, atmospheric, or audible elements that are out of character with a property or setting.

3.9.5 Environmental Consequences

Proposed Action (Alternative A)

The implementation of the Proposed Action would not affect historic properties or tribal cultural and spiritual resources. There are no historic properties within or near the APE. The NGB is consulting

with the Indiana SHPO regarding this Proposed Action; the SHPO will be provided the opportunity to review and comment on the project and impacts on historic properties. Native American tribes that may have in interest in the project were contacted as well to determine if they had any concerns. Copies of interagency correspondence letters can be found in Appendix B.

Effects Considered with Other Proposed Actions

There are no Historic Properties or unevaluated resources located within the APE; therefore, there would be no effect to Historic Properties associated with close causal relationships with any reasonably foreseeable actions. Additionally, no resources of cultural or spiritual significance were identified by Native American governments consulted during the preparation of this EA.

No Action Alternative (Alternative B)

The No Action Alternative would not affect historic properties or tribal cultural and spiritual properties. There are no historic properties or tribal cultural and spiritual properties within or near the APE.

3.10 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

3.10.1 Definition of Resource

Hazardous materials include any substance with physical properties that make it dangerous or capable of having a harmful effect on human health or the environment. Hazardous waste is generated from many sources, ranging from industrial manufacturing wastes to household batteries.

Concerns related to hazardous materials and wastes typically center around storage tanks and the storage, transport, and use of materials such as pesticides; fuel; and petroleum, oils, and lubricants (POL). When these materials are improperly used or stored, they can threaten the health and well-being of people, wildlife, vegetation, soils, and water resources. Per DOD regulations, all facilities have Hazardous Waste Management Plans and Spill Prevention, Control, and Countermeasure Plans to protect people and the environment from inadvertent and potentially harmful releases. In addition, legislation such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) further protect human and environmental safety.

3.10.2 Affected Environment

Storage Tanks and Oil-Water Separators

Fort Wayne ANGB uses aboveground storage tanks (ASTs) for bulk fluid storage, and all ASTs are equipped with adequate secondary containment to prevent any hazardous materials from reaching navigable waters. There are oil-water separators on the installation that prevent potential pollution sources from entering the sanitary sewer system. The installation has no underground storage tanks (INANG, 2017b).

Fuel storage at the 122 FW includes Jet A, diesel fuel, and motor vehicle gasoline. Jet A and ground vehicle fuel are contained in ASTs. Degreasers, hydraulic, deicing fluids, used oils, and solvents are stored in 55-gallon drums (INANG, 2017b).

Environmental Restoration Program

Four Environmental Restoration Program (ERP) sites are on Fort Wayne ANGB, and all have been closed. None of the construction proposed under this action would involve ground disturbance at any of these sites.

Hazardous Materials and Wastes

Operations at the installation to support the 122 FW mission that may involve the use of hazardous materials include aircraft fueling, deicing, maintenance; aerospace ground equipment maintenance; ground vehicle maintenance and fueling; and facilities maintenance. Hazardous materials (e.g., oils, solvents, paint, thinners, batteries, adhesives, enamels, and degreasers) are stored within the Hazardous Materials Pharmacy, a secure facility, before going to designated locations on the installation. Hazardous wastes are temporarily stored in a Hazardous Waste Storage Facility prior to disposal. Personnel working at facilities that transfer or store hazardous substances in bulk must comply with Hazardous Waste Operations and Emergency Response regulations that include communication, emergency action plan, and training standards (INANG, 2017b).

The 122 FW has an Oil and Hazardous Substances Spill Prevention and Response Plan (SPRP) (INANG, 2017b) that fulfills the requirements of both a Spill Prevention, Control, and Countermeasure Plan (as required under 40 CFR 112) and an Oil and Hazardous Substance Pollution Contingency Plan (as required under Air Force Policy Directive 32-70 and AFI 10-2501). The SPRP outlines spill prevention measures and primary responsibilities and protocols in the event of a spill.

Fort Wayne ANGB conducted a basewide site inspection for per- and polyfluoroalkyl substances (PFAS) to determine the presence of PFAS and assess the locations, quantities, and concentrations. There are multiple areas of Fort Wayne ANGB that have detected levels of PFAS, and further investigation at the determined locations is needed to assess the nature and extent of contamination, including an expanded conceptual site model and an expanded delineation. Further, the site inspection recommended that Fort Wayne ANGB conduct preliminary site-specific risk assessment calculations to identify PFAS and establish preliminary remedial goals for screening purposes (NGB, 2018b).

3.10.3 Significance Criteria

Impacts on hazardous materials, solid waste, and pollution prevention would be considered significant if an action would violate federal, state, or local laws or regulations regarding hazardous materials and/or solid waste management, or produce an appreciably different quantity or type of hazardous material or solid waste for which the ANG is not prepared or does not have adequate management and response plans in place and would adversely affect human health and the environment.

3.10.4 Environmental Consequences

Proposed Action (Alternative A)

In the short-term during construction and renovation activities, the use of hazardous materials and petroleum products would be required. The temporary storage of hazardous materials for construction would adhere to all existing protocols and requirements for the handling, storage, and disposal of hazardous materials.

No active ERP sites are present on Fort Wayne ANGB, and construction activities under the Proposed Action would not be located within ERP sites.

Under the Proposed Action, one construction project and two renovation projects would occur on land that has detected levels of PFAS in the soils. Fort Wayne ANGB would conduct site-specific assessments to determine whether materials generated by construction and ground disturbance would contain levels of PFAS above regulatory limits. If present, a Media Management Plan would be prepared to identify, evaluate, manage, and abate PFAS hazards to environment or human health and safety.

F-16 aircraft require the use of hydrazine (H-70) to operate the aircraft's emergency power unit. Storage of 6.8-gallon canisters of H-70 on the installation would be required under the Proposed Action, to meet the requirements of the proposed 24 F-16 aircraft, as well as spare cylinders. Hydrazine is considered an extremely hazardous substance, and it is subject to reporting requirements under EPCRA and CERCLA. It falls under the U133 waste stream code under RCRA.

The presence of extremely hazardous substances in quantities at or above a threshold planning quantity requires certain emergency planning activities to be conducted. The amount of hydrazine stored on Fort Wayne ANGB would be above 1,000 pounds, which would require certain emergency planning activities to be conducted. Under EPCRA Section 302 Extremely Hazardous Substances, hydrazine in quantities over 1,000 pounds require that Local Emergency Planning Committees must develop emergency response plans and the facility owner or operator must notify the State Emergency Response Commission. In addition, facilities are subject to reporting requirements under EPCRA Section 311, which requires that a material safety data sheet or a list of covered chemicals to the State Emergency Response Commission, Local Emergency Response Commission, and local fire department, and EPCRA Section 312, which requires that the facility submit inventory forms (Tier I or Tier II). Under EPCRA Section 304, releases of one pound or greater of hydrazine are subject to state and local reporting requirements (USEPA, 2015). Fort Wayne ANGB would comply with all EPCRA regulations and reporting requirements for hydrazine.

A new hydrazine storage facility would be constructed under the Proposed Action to provide the specific storage needs for H-70 on Fort Wayne ANGB; this facility would comply with all federal safety regulations for storage of this material, including secondary containment and security. The storage facility would consist of an enclosed concrete block building with a metal roof, internal secondary containment, and a locked security fence. The spare cylinders would be kept in sealed cases and would only be accessible by authorized personnel. No hazardous wastes are generated with the storage of hydrazine canisters on the installation.

A Hydrazine Response Plan would establish response procedures in the event of hydrazine-related incidents to provide for safe coordination of emergency response. A Hydrazine Response Working Group would establish and coordinate awareness, training, and response procedures with installation personnel, Guardsmen, local air traffic control, and civilian public safety.

The quantity of hazardous wastes generated under the Proposed Action would be expected to remain similar to current levels. The installation SPRP would continue to be followed to reduce the potential for a release of hazardous material or pollution, and to provide spill contingency and response requirements. The safe handling, storage, and use procedures under the 122 FW Hazardous Waste

Management and the SPRP would continue to be implemented, in accordance with all federal, state, and local regulations, regarding all hazardous materials and petroleum products. Changes associated with hazardous materials under the Proposed Action would necessitate updates to the installation's Hazardous Waste Management Plan and SPRP upon implementation of the action. Impacts associated with changes in hazardous materials on the installation would be minor.

All solid waste would be collected and transported offsite for disposal. Solid waste generated by the additional personnel under the Proposed Action (10 personnel to report regularly and 90 personnel to report to the monthly drill weekend) would be minor and accommodated by the existing solid waste management systems on the installation. Solid waste generated by demolition and construction projects under the Proposed Action would be disposed in accordance with federal, state, and local regulations for the collection and disposal of municipal solid waste. Where possible, material would be recycled, reused, or otherwise diverted from landfills in accordance with Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*. All nonrecyclable construction and demolition waste would be collected in a dumpster until removed. Minor impacts on solid waste would be expected under the Proposed Action due to the proposed renovation, construction, and demolition. Impacts on hazardous materials, solid waste, and pollution prevention would be less than significant.

Effects Considered with Other Proposed Actions

Reasonably foreseeable actions on and off Fort Wayne ANGB are not anticipated to result in significant collective impacts on hazardous materials, solid waste, and pollution prevention when considered with the Proposed Action. Proposed construction located outside of Fort Wayne ANGB would not contribute to impacts of hazardous materials, solid wastes, or pollution that are anticipated from the Proposed Action. For the construction projects occurring on the installation—the stormwater improvements and the fire station construction and repair—no significant collective impacts would be expected. The stormwater improvements would benefit the installation's pollution prevention by providing an adequate stormwater system and preventing localized flooding on the installation. All proposed installation projects would be conducted in accordance with federal, state, and local regulations and the installation's procedures and safety practices for the handling of hazardous materials and wastes. Impacts would be less than significant.

No Action Alternative (Alternative B)

Under the No Action Alternative, there would be no F-16 aircraft and no new construction at Fort Wayne ANGB. The 122 FW mission would continue with the current A-10 aircraft at current levels. There would be no change in the hazardous materials, solid waste, or pollution prevention at the installation.

CHAPTER 4. MANAGEMENT ACTIONS / SPECIAL PROCEDURES

The analysis in Chapter 3 does not identify any significant impacts from implementation of the Proposed Action or alternatives. The following discusses specific management actions or special procedures from Chapter 3 that would minimize adverse effects on the environment or human health and safety.

Safety/Aircraft Safety and Hazardous Materials, Hazardous Wastes, and Pollution Prevention (Sections 3.2 and 3.10)

- The F-16 aircraft would require the use and storage of hydrazine (H-70). To ensure safe operation for personnel as well as any individual that may be in proximity to H-70, a Hydrazine Response Plan would be developed.
- The Proposed Action and associated projects would require a technical amendment to the 122 FW Oil and Hazardous Substances Spill Prevention and Response Plan (SPRP) and an update to the Stormwater Pollution Prevention Plan (SWPPP).
- If materials generated by construction and ground disturbance contain levels of PFAS above regulatory limits a Media Management Plan would be prepared.

Water Resources (Section 3.7)

- Site-specific plans detailing erosion and sedimentation controls and best management practices during construction would minimize potential for indirect short-term construction-related impacts on water resources.
- If the increase in impervious surface from construction exceeds thresholds (5,000 square feet), designs for stormwater runoff would be implemented as required under Section 438 of the Energy Independence and Security Act to preserve the pre-project hydrology.

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APPENDIX A
APPLICABLE LAWS, REGULATIONS, AND EXECUTIVE ORDERS AND BASIS OF CONSIDERATION FOR RESOURCES ANALYZED IN THIS ENVIRONMENTAL ASSESSMENT

The National Guard Bureau (NGB), with the Federal Aviation Administration (FAA) acting as a cooperating agency, is preparing this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 Code of Federal Regulations [CFR] 4321–4347), as implemented by the Council on Environmental Quality (CEQ) regulations (40 CFR 1500–1508, as revised 2020), the U.S. Air Force's Environmental Impact Analysis Process (EIAP; 32 CFR 989), Air Force Instruction (AFI) 32-1015, and FAA's Environmental Impacts: Policies and Procedures (FAA Order 1050.1F).

CEQ's regulations encourage agencies to prepare brief EAs that provide sufficient evidence and analysis to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). To keep the text of the EA concise, supplementary information concerning regulatory and general resource background is included in this appendix.

In addition to NEPA and regulations that guide the implementation of NEPA, there are other environmental laws and Executive Orders (EOs) that must be considered when preparing environmental analyses; these are summarized according to the general resources areas within which they are considered. The FAA also defined environmental impact categories that may be relevant to FAA actions in FAA Order 1050.F.

Table A-1 summarizes the full range of resources (or environmental impact categories) considered in this EA. The following sections provide the general background, regulatory context, and, where applicable, a more detailed discussion on the basis for not considering this resource in detail.

Table A-1 Summary of Environmental Resource Areas Analyzed in this Environmental Assessment

Resource Area in this EA	FAA Environmental Impact Category	Evaluated in Detail?	Sections for Further Information
Safety/Aircraft Safety	Safety	Yes	Section 3.2; Appendix A, A.1
Airspace Management	—	Yes	Section 3.3; Appendix A, A.2
Air Quality	Air Quality	Yes	Section 3.4; Appendix A, A.3
Climate Change	Climate	Yes	Section 3.5
Coastal Resources	Coastal Resources	No	Appendix A, A.5 Appendix E
Department of Transportation Act, Section 4(f) Resources	Department of Transportation Act, Section 4(f) Resources	No	Appendix A, A.6
Noise and Noise Compatible Land Use	Noise and Compatible Land Use	Yes	Section 3.6; Appendix A, A.7
Land Use	Land Use	No	Appendix A, A.8
Geological Resources	Farmlands	No	Appendix A, A.9
Water Resources	Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)	Yes	Section 3.7; Appendix A, A.10
Biological Resources	Biological Resources (including fish, wildlife, and plants)	Yes	Section 3.8; Appendix A, A.11
Infrastructure and Transportation	Natural Resources and Energy Supply	No	Appendix A, A.12
Visual Resources	Visual Effects (including light emissions)	No	Appendix A, A.13
Historic Properties	Cultural Resources	Yes	Section 3.9; Appendix A, A.14
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	No	Appendix A, A.15
Hazardous Materials, Solid Waste, and Pollution Prevention	Hazardous Materials, Solid Waste, and Pollution Prevention	Yes	Section 3.10; Appendix A, A.16

Note: DAF resource areas were based on those identified in the AF Form 813, Request for Environmental Impact Analysis. FAA Environmental Impact Categories are defined in FAA Order 1050.F; they are listed and grouped here to facilitate FAA review processes. Neither NEPA nor CEQ implementing regulations define a full list of specific resource areas or categories of impact.

A.1 SAFETY/AIRCRAFT SAFETY

Safety and aircraft safety relate to both military training flight safety and ground safety. Military training flight safety is primarily concerning the potential for aircraft accidents, which may be caused by weather-related accidents, mechanical failure, pilot error, mid-air collisions with manmade structures or terrain, or bird/wildlife aircraft strikes.

Basis of Consideration in this EA: The Proposed Action involves a conversion from A-10 aircraft to F-16 aircraft at Fort Wayne ANGB. Different aircraft have different mishap rates and risk factors that should be considered. The Proposed Action also includes the construction of multiple new facilities, including a new munitions storage complex (Project 3) and a hydrazine storage shed (Project 9) which would house explosive and hazardous substances. Therefore, safety and aircraft safety are further analyzed in Section 3.2 of this EA.

A.2 AIRSPACE MANAGEMENT

Controlled Airspace

Controlled airspace is a generic term that encompasses the different classifications of airspace (Class A, B, C, D, and E airspace, shown in Figure A-1) and defines dimensions within which air traffic control service is provided to Instrument Flight Rules (IFR) flights and to Visual Flight Rules (VFR) flights. All military and civilian aircraft are subject to Federal Aviation Regulations.

Figure A-1 Airspace Profile

(FAA, 2016)

Class A Airspace

Class A airspace includes all flight levels or operating altitudes over 18,000 feet above mean sea level (MSL). Class A airspace is dominated by commercial aircraft utilizing routes between 18,000 and 60,000 feet MSL.

Class B Airspace

Class B airspace typically comprises contiguous cylinders of airspace, stacked upon one another, extending from the surface up to 14,500 feet MSL. To operate in Class B airspace, pilots must contact appropriate controlling authorities and receive clearance to enter the airspace. Additionally, aircraft operating within Class B airspace must be equipped with specialized electronics that allow air traffic controllers to accurately track aircraft speed, altitude, and position. There are no Class B airports in Indiana.

Class C Airspace

Airspace designated as Class C can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude. Class C airspace is designed and implemented to provide additional air traffic control (ATC) into and out of primary airports where aircraft operations are periodically at high-density levels. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local ATC entities. Several Class C airports are in Indiana (Fort Wayne International Airport, Evansville Regional Airport, Indianapolis International Airport, and South Bend Regional Airport). Fort Wayne International Airport is where Fort Wayne ANGB is located.

Class D Airspace

Class D airspace encompasses a five-statute-mile radius of an operating ATC-controlled airport, extending from the ground to 2,500 feet above ground level (AGL) or higher. All aircraft operating within Class D airspace must be in two-way radio communication with the ATC facility.

Class E Airspace

Class E airspace can be described as general controlled airspace. It includes designated federal airways consisting of the high-altitude (J or "Jet" Route) system and low-altitude (V or "Victor" Route) system. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Also included in this class of airspace are Federal Airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to or from the terminal or en route environment and en route domestic and offshore airspace, designated below 18,000 feet MSL.

Uncontrolled Airspace

Uncontrolled airspace (Class G) is not subject to restrictions that apply to controlled airspace. Limits of uncontrolled airspace typically extend from the ground surface to 700 feet AGL in urban areas and from the ground surface to 1,200 feet AGL in rural areas. Uncontrolled airspace can extend above these altitudes to as high as 14,500 feet MSL if no other types of controlled airspace have been assigned. ATC does not have authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating in accordance with VFR.

Special Use Airspace

Special Use Airspace (SUA) consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. Except for Controlled Firing Areas, SUA is depicted on aeronautical charts, including hours of operation, altitudes, and the agency controlling the airspace. All special use airspace descriptions are contained in FAA Order 7400.8, *Special Use Airspace*.

Prohibited Areas and Restricted Areas (RA, or R-; e.g., R-3403A/B) are regulatory SUA that are established in FAR Part 73 through the rulemaking process. Warning Areas, Controlled Firing Areas, and Military Operations Areas (MOAs) are nonregulatory SUA. This EA involves RAs and MOAs.

Warning Areas are airspace of defined dimensions over international waters that contain activity that may be hazardous to nonparticipating aircraft. Because international agreements do not provide

for prohibition of flight in international airspace, no restrictions to flight are imposed. As such, Warning Areas are established in international airspace to alert pilots of nonparticipating aircraft to potential danger.

Controlled Firing Areas are established to contain activities that, if not conducted in a controlled environment, would be hazardous to nonparticipating aircraft. The approval of a Controlled Firing Areas shall only be considered for those activities that are either of short duration or of such a nature that they could be immediately suspended upon notice that such activity might endanger nonparticipating aircraft. Examples of such activities include firing of missiles, rockets, anti-aircraft artillery, and field artillery; static testing of large rocket motors; blasting; and ordnance or chemical disposal.

MOAs are airspace areas designated outside of Class A airspace, to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. IFR traffic may be cleared to enter and pass through the area if adequate IFR separation criteria can be met, and procedures are described in a Letter of Agreement between the unit and the ATC-controlling agency (FAA Order 7400.2M). Nonparticipating VFR aircraft are not prohibited from entering an active MOA; however, extreme caution is advised when such aircraft transit the area during military operations. All MOAs within the United States are depicted on sectional aeronautical charts identifying the exact area, name, altitudes of use, published hours of use, and the corresponding controlling agency.

Basis of Consideration in this EA: Under the Proposed Action there would be no change in the operations and training area used by the 122 FW, but there would be a change in aircraft used. Airspace management is considered further in Section 3.3 of this EA.

A.3 AIR QUALITY

Criteria Pollutant National Ambient Air Quality Standards

In accordance with **Clean Air Act** requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. Measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). Regional air quality is a result of the types and quantities of atmospheric pollutants and pollutant sources in an area as well as surface topography, the size of the "air basin," and prevailing meteorological conditions.

The Clean Air Act directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed numerical concentration-based standards—National Ambient Air Quality Standards (NAAQS)—for pollutants that have been determined to impact human health and the environment and established both primary and secondary NAAQS. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulates equal to or less than 10 micrometers in diameter and particulates equal to or less than 2.5 micrometers in diameter, or $PM_{10}/PM_{2.5}$, respectively), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources in addition to maintaining visibility standards. The primary and secondary NAAQS are presented in Table A-2.

Table A-2 National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	primary	8 hours 1 hour	9 ppm 35 ppm	Not to be exceeded more than once per year
Lead (Pb)	primary and secondary	Rolling 3-month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)	primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution $PM_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
	secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
	primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)	primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(USEPA, 2021c)

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Key: µg/m^3 = micrograms per cubic meter; CO = carbon monoxide; NO_2 = nitrogen oxides; O_3 = ozone; Pb = lead; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; PM_{10} = particulate matter less than or equal to 10 micrometers; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide.

The criteria pollutant O_3 is not usually emitted directly into the air but is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants, or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. Regulatory agencies limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_x.

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

USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. When a region or area fails to meet an NAAQS for a pollutant, that region is classified as "nonattainment" for that pollutant. In such cases the affected state must develop a State Implementation Plan (SIP) that is subject to USEPA review and approval. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.

General Conformity

The Clean Air Act required USEPA to draft general conformity regulations that are applicable in nonattainment areas, or in designated maintenance areas (which are attainment areas that were reclassified from a previous nonattainment status and are required to prepare a maintenance plan for air quality). These regulations are designed to ensure that federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and the promulgated regulations found in 40 CFR Part 93 exempt certain federal actions from conformity determinations (e.g., contaminated site cleanup and natural disaster response activities). Other federal actions are assumed to conform if total indirect and direct project emissions are below *de minimis* levels presented in 40 CFR 93.153(b), as shown in Table A-3. The threshold levels—in tons of pollutant per year (tpy)—depend on the nonattainment status that USEPA has assigned to a region. For actions in nonattainment or maintenance areas, federal agencies must calculate all projected direct and indirect emissions and compare the total to the *de minimis* thresholds to determine if a formal General Conformity Determination is required.

Air Operating Permits

Title V of the Clean Air Act Amendments of 1990 requires state and local agencies to implement permitting programs for major stationary sources. A major stationary source is a facility (plant, base, activity, etc.) that has the potential to emit more than 100 tpy of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants; however, lower pollutant-specific "major source" permitting thresholds apply in nonattainment areas. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Table A-3 General Conformity *de minimis* Thresholds for Nonattainment and Maintenance Areas

Nonattainment Designation	*de minimis* (tpy)
Ozone (VOCs or NO_x):	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Other ozone nonattainment areas outside an ozone transport region	100
Other ozone nonattainment areas inside an ozone transport region:	
VOC	50
NO_x	100
Carbon monoxide: all nonattainment areas	100
SO_2 or NO_2: all nonattainment areas	100
PM_{10}:	
Moderate nonattainment areas	100
Serious nonattainment areas	70
$PM_{2.5}$ (direct emissions, SO_2, NO_x, VOC, and Ammonia):	
Moderate nonattainment areas	100
Serious nonattainment areas	70
Pb: all nonattainment areas	25
Maintenance Designations	***de minimis* (tpy)**
Ozone (NO_x, SO_2, or NO_2):	
All maintenance areas	100
Ozone (VOCs):	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
Carbon monoxide: all maintenance areas	100
PM_{10}: all maintenance areas	100
$PM_{2.5}$ (direct emissions, SO_2, NO_x, VOC, and Ammonia): all maintenance areas	100
Pb: all maintenance areas	100

(40 CFR 93.153(b))

Key: CO = carbon monoxide; NO_2 = nitrogen oxides; NO_x = nitrogen oxides; Pb = lead; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; PM_{10} = particulate matter less than or equal to 10 micrometers; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compounds.

Prevention of Significant Deterioration

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be "significant" if a proposed project's net emission increase meets or exceeds the rate of emissions listed in 40 CFR 52.21(b)(23)(i); or (1) a proposed project is within 10 kilometers (6.2 miles) of any Class I area (i.e., wilderness area greater than 5,000 acres or national park greater than 6,000 acres), and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more, per 40 CFR 52.21(b)(23)(iii). PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's designation as Class I, II, or III (40 CFR 52.21(c)).

Hazardous Air Pollutants

National standards for hazardous air pollutants (HAPs) are regulated under Section 112(b) of the 1990 Clean Air Act Amendments. The National Emission Standards for Hazardous Air Pollutants regulate HAP emissions from stationary sources (40 CFR part 61).

HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and nonroad equipment that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA identified 201 compounds as being HAPs that require regulation. A subset of six of the MSAT compounds was identified as having the greatest influence on health: benzene, butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. In 2007, USEPA issued a second MSAT Rule generally supporting the findings in the first rule and providing additional recommendations of compounds having the greatest impact on health. Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

Basis of Consideration in this EA: The existing affected environment is presented in Section 3.4.2. The area affected by the Proposed Action encompasses a large land area, up to the mixing height of 3,000 feet AGL. Table 3-2 shows the air quality control regions and attainment statuses by county, identifying which proposed change occurs within each county. Table A-4 summarizes existing stationary source emissions at Fort Wayne ANGB.

The DAF Air Conformity Applicability Model—ACAM—was used to estimate air emissions for the Proposed Action (AFCEC, 2021). Appendix E includes the Record of Non-Applicability (RONA) for this action as well as the ACAM summary report and detailed report. The detailed ACAM report includes the methodologies and emissions supporting each activity associated with implementing the Proposed Action.

Table A-4 Fort Wayne ANGB Stationary Source Criteria Pollutant Emissions (CY19)

Category	CO (tpy)	NO_x (tpy)	PM_{10} (tpy)	SO_x (tpy)	VOC (tpy)	HAP (tpy)
Total Actual Emissions	1.55	1.62	0.26	0.07	1.99	0.54
Total PTE	13.72	11.43	1.32	0.18	4.54	1.36
Minor Source Thresholds (PTE)	100	25	25	25	25	10 (single) 25 (combined)
Major Source Thresholds (PTE)	100	100	100	100	100	10 (single) 25 (combined)

(NGB and 122 FW, 2020)

Key: CO = carbon monoxide; HAP = hazardous air pollutants; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 micrometers; SO_x = sulfur oxides; tpy = tons per year; VOC = volatile organic compounds.

A.4 CLIMATE CHANGE

Greenhouse Gases

Greenhouse gases (GHGs) trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere helps regulate the earth's temperature and contribute to global climate effects. The principal GHGs that enter the atmosphere because of human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. Each GHG has an estimated global warming potential that is a function of its atmospheric lifetime and ability to absorb and radiate infrared energy emitted from the earth's surface. GHG emissions are standardized to CO_2, which has a value of one. The CO_2 equivalent (CO_2e) rate is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs.

Basis of Consideration in this EA: Climate Change is analyzed in Section 3.5 of this EA.

A.5 COASTAL RESOURCES

The **Coastal Zone Management Act of 1972** established national policy to preserve, protect, develop, restore, or enhance resources in the coastal zone, including the Great Lakes. Federal agencies have an obligation to implement actions within the coastal zone to the maximum extent practicable with the enforceable policies of federally approved state coastal management programs. Federal lands, which are "lands the use of which is by law subject solely to the discretion of the Federal Government, its officers, or agents," are statutorily excluded from the State's "coastal uses or resources," unless the proposed federal activity affects coastal uses or resources beyond the boundaries of the federal property (i.e., has spillover effects).

Indiana participates in the Lake Michigan Coastal Program, through which the Coastal zone Management Program for the lake is implemented. As a federal agency, NGB is required to determine whether its proposed activities would affect the coastal zone. This takes the form of a consistency determination, a negative determination, or a determination that no further action is necessary.

Basis of Consideration in this EA: No part of the Proposed Action would occur within the established Lake Michigan Coastal Program Area in Indiana. The proposed mission conversion to F-16 aircraft at Fort Wayne ANGB would have no effect on coastal resources, and no further action is necessary. Therefore, coastal resources are not carried forward for detailed analysis in this EA.

A.6 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F) RESOURCES

Section 4(f) of the Department of Transportation Act protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) applies only to agencies within the U.S. Department of Transportation, including the FAA.

Section 4(f) properties include the following:

- parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public
- publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public

- historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public

Basis of Consideration in this EA: Military flight operations and designation of airspace for such operations are exempt from Section 4(f), per the U.S. Department of Defense Reauthorization in 1997 (Public Law 105-85). The construction projects included in the Proposed Action would be located entirely within the Fort Wayne ANGB and Fort Wayne International Airport property, and thus would not affect Section 4(f) properties. Therefore, Section 4(f) resources are not carried forward for detailed analysis in this EA.

A.7 NOISE

Noise is analyzed in Section 3.6 of this EA.

A.8 LAND USE

"Land use" is the term used to describe the human use of land. It represents the economic and cultural activities (e.g., agricultural, residential, industrial, mining, and recreational uses) that are practiced at a given place. Public and private lands frequently represent very different uses. For example, urban development seldom occurs on publicly owned lands (e.g., parks, wilderness areas), while privately owned lands are infrequently protected for wilderness uses. For this EA, land use is described generally beneath the airspace used by the 122 FW aircraft, with more emphasis on the land use surrounding Fort Wayne ANGB and FWA.

FWA is located in Allen County, Indiana, at the southern boundary of the city of Fort Wayne and occupies approximately 3,000 acres of land. Allen County is predominantly agricultural land uses (65.3 percent of the total land area). Single-family residential uses make up 14.7 percent of the total land area in the county. Much of the developed land in the county is within the city of Fort Wayne and its surrounding area (Allen County, 2007). FWA is within an agricultural and rural residential area, with several industrial warehouse facilities nearby (INANG, 2011a).

The 122 FW occupies around 190 acres of leased land in the eastern portion of FWA. Land use on the installation is categorized as airfield pavement (34.9 acres), aircraft operations (4.7 acres), industrial facilities (23.5 acres), special categories (e.g., small arms ranges, munitions maintenance and training, munitions storage.; 27.7 acres), open/training space (60.6 acres), maintenance facilities (19.5 acres), and command and support (18.1 acres). Approximately 30 percent of the installation is undeveloped open space (INANG, 2011a).

Basis of Consideration in this EA: All renovation and construction projects proposed under the Proposed Action would be either on Fort Wayne ANGB property or on an airport runway. These areas are zoned industrial by the Fort Wayne Department of Planning Services, and the proposed construction would be consistent with the existing land use and with the 122 FW Installation Development Plan (INANG, 2011a). Impacts on land use from the Proposed Action would be negligible- to minor. Impacts associated with noise compatible land use associated with the Proposed Action are described in Section 3.6. Therefore, land use is not carried forward for detailed analysis in this EA.

A.9 GEOLOGICAL RESOURCES

Consideration of geologic resources extends to prime or unique farmlands. The **Farmland Protection Policy Act (FPPA)** aims to minimize the loss of prime farmland and unique farmlands as a result of federal actions. The implementing procedures of the FPPA require federal agencies to evaluate the adverse effects of their activities on farmland, which includes prime and unique farmland and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects. Land that is already in urban development is not subject to the FPPA.

According to the U.S. Geological Survey (USGS) topographic dataset, the topography of the study area is nearly level with elevations ranging from 769 feet above mean sea level (MSL) in the northern portion to 797 feet MSL in the south (Appendix G, Figure G-1).

The study area is located within the Bluffton Till Plain subsection of the Central Till Plain region of northeastern Indiana, an area within the Central Lowlands Physiographic Province (Gray, 2000). Topography and drainage of this region is the result of multiple glacial movements and resulted in the deposit of clayey material from the lake deposits. Glacial tills of the Pleistocene Lagro Formation make up the shallow, poorly drained soils (INANG, 2004).

According to the Soil Survey Geographic Database, two soil map units are found in the study area: (1) Blount Series of silty loam, zero to two percent slopes, very deep, somewhat poorly drained soils on slight rises, flat areas, and knolls; (2) and the Pewamo Series of silty clay loam, zero to one percent slopes of very poorly drained soils on depression, drainageways and flat areas (Appendix G, Figure G-5).

The Fort Wayne ANGB property is zoned industrial by the Fort Wayne Department of Planning Services, which is considered urban development and, thus, not subject to the FPPA.

Basis of Consideration in this EA: Construction activities proposed under the Proposed Action would involve ground disturbance. However, none of the soils at the proposed construction sites are subject to the FPPA, so the Proposed Action would not convert any important farmland to nonagricultural uses. No coordination with the Natural Resources Conservation Service pursuant to the FPPA is required.

Ground-disturbing activities under the Proposed Action associated with construction, renovation, and demolition are limited to areas that have been previously disturbed, modified with impervious surfaces, or landscapes that are regularly maintained. Therefore, no effect on topography, soils, or geology are anticipated as a result of the proposed action. Geological resources are not carried forward for detailed analysis in this EA.

A.10 WATER RESOURCES

Water resources are analyzed in Section 3.7 of this EA.

A.11 BIOLOGICAL RESOURCES

Biological resources are analyzed in Section 3.8 of this EA.

A.12 INFRASTRUCTURE AND TRANSPORTATION

Infrastructure systems include the local and regional network that supplies all drinking water production, storage, and distribution; wastewater collection treatment and disposal; storm water management, solid waste management, energy production, transmission, and distribution; and communications. Infrastructure systems can also include ground-based facilities, ranges, training areas, airfield pavements, and other supporting structures that are localized to a project site. Transportation includes the local and regional network of roadways, bus routes, railways, subways, bikeways, and trails.

Basis of Consideration in this EA: The change in aircraft at Fort Wayne ANGB would not directly result in changes in infrastructure systems or transportation networks on or near the installation. The facilities projects proposed to support the new aircraft mission would tie into existing utility systems on the installation. The existing utility systems on Fort Wayne ANGB (including electrical distribution, water distribution, fire protection, natural gas distribution, sanitary sewer, fuel distribution, and communications) are in generally good condition and have adequate capacity (INANG, 2011a). The 122 FW is in the planning stages of repairs and upgrades to the stormwater collection and retention system, which will provide adequate stormwater structures, outflows, and retention to the entire installation, including planned and future development. The Proposed Action construction projects are primarily renovations, which would upgrade existing buildings to suit existing mission needs and DAF standards. Infrastructure is already in place at the buildings that would undergo renovations. The proposed new construction projects would tie into the installation infrastructure, which have adequate capacity. The new facilities would be expected to have negligible impacts on the infrastructure on the airport. As such, infrastructure is not carried forward for detailed analysis in this EA.

Fort Wayne ANGB is located within the city of Fort Wayne, Indiana. Interstate (I)-69, the primary north-south highway in northeast Indiana, traverses the northwest of Fort Wayne. I-469 is a beltway providing access to the eastern and southeastern parts of the city and connects to I-69 to the north and southwest of Fort Wayne. Fort Wayne ANGB and Fort Wayne International Airport are situated approximately seven miles south/southwest of the central Fort Wayne business district. The primary access to the airport's terminal area and the Fort Wayne ANGB is Ferguson Road.

The 122 FW is located off West Ferguson Road, north of I-469 and east of I-69. The installation's main gate is located along its northern boundary on West Ferguson Road. The main gate feeds directly onto Warehouse Road, which runs north-south on the installation. Transport Road and Munitions Way provide east-west access to Sefton Drive, which runs north-south on both sides of the railroad, and crosses the railroad in front of Building 780, Wing Headquarters. The Norfolk Southern Railroad bisects the installation. The roads throughout Fort Wayne ANGB are primarily used by privately owned vehicles for access to the buildings in which personnel work. In addition, there are a variety of delivery trucks within ANGB such as for commercial items, fuel, liquid oxygen/nitrogen, and other military items such as arms and munitions. The primary circulation routes through Fort Wayne ANGB are Warehouse Road, Munitions Way, and Sabre Drive, the latter of which provides crossing over the railroad. The secondary routes are Transport Road, a portion of Sabre Drive, and Fenceline Road (INANG, 2011a). Although Transport Road is listed as a secondary road, it is identical in treatment, size, and condition as Munitions Way. Similarly, the portion of Sabre Drive that is listed as secondary is identical as the primary road section. These secondary roads provide similar access from

Warehouse Road to ANGB buildings and on the west side of the railroad. A portion of Fenceline Road is merely a large privately-owned vehicle parking area for Buildings 734, 740, and 732 through which a vehicle runs north to a controlled access gate. Fenceline Road continues north to intersect with West Ferguson Road.

The additional personnel of 90 people one weekend a month for unit training drills is approximately an 8 percent increase in personnel on those days. In addition, there would be 10 added personnel reporting daily at Fort Wayne ANGB, which is not quite a one percent increase in personnel. The primary access road to the airport, Airport Expressway, has an average annual daily traffic of over 13,000 vehicles, and the Fort Wayne ANGB access, West Ferguson Road, has an average annual daily traffic of approximately 4,000 vehicles (INDOT, 2020). The addition of 10 personnel reporting daily under the Proposed Action, and 90 personnel reporting one weekend a month for unit training drills, would not cause a noticeable change in traffic levels or access on the public road systems.

Currently there is enough parking on the installation to support the additional personnel under the Proposed Action. Some of the parking spaces are not directly in front of the buildings that personnel would access; however, additional parking spaces are proposed at the installation and will likely be constructed in approximately five years.

The increase of personnel at Fort Wayne ANGB reporting full-time and during unit training drills would result in negligible effects on the infrastructure, transportation, and circulation of the installation. As such, transportation is not carried forward for detailed analysis in this EA.

A.13 VISUAL RESOURCES

Visual effects deal broadly with the extent to which a proposed action would produce light emissions that create annoyance or interfere with activities; or contrast with, or detract from, the visual resources and/or the visual character of the existing environment.

Light emissions include any light that emanates from a light source into the surrounding environment. Examples of sources of light emissions include airfield and apron flood lighting, navigational aids, terminal lighting, parking facility lighting, roadway lighting, safety lighting on launch pads, additional lighting to support nighttime commercial space launches, and light generated from such launches. Glare is a type of light emission that occurs when light is reflected off a surface (e.g., window glass, solar panels, or reflective building surfaces).

Visual resources include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics. Visual character refers to the overall visual makeup of the existing environment where the proposed action and alternative(s) would be located. For example, areas near densely populated areas generally have a visual character that could be defined as urban, whereas less developed areas could have a visual character defined by the surrounding landscape features, such as open grass fields, forests, mountains, or deserts, etc.

Regional Visual Character

The areas below the Twelve Mile MOA Complex and the Hill Top MOA are predominantly rural land, consisting primarily of open space and agricultural land with patches of forests adjacent to

agricultural lands as well as forests along the creeks and rivers. In addition, there are a few small urban areas under these two MOAs. The Racer MOA is predominantly above the Brown County State Park, which is rural and consists almost entirely of forest land. The area to the east side of the park, which is also under the Racer MOA, is more populous with the city of Columbus and its metropolitan area. The area below the JPG MOA is rural and consists of open space, agricultural land, and forest cover. It is much more covered in wooded areas than the northern MOAs. The Buckeye MOA and the Brush Creek MOA cover over a heavily forested area, some of which is the Pike Lake State Park. The westernmost area of the Buckeye MOA is primarily agricultural, open land, and forested but much less so than the state park areas. This section also features pockets of town and village centers along transportation routes. Viewsheds across each of these areas are typical of marginally developed, rural areas with predominantly natural settings. The areas to the south of Fort Wayne ANGB compared to the northern MOAs would have significantly less views due to the increase of elevation and forested areas.

Installation

The visual setting for the Proposed Action on Fort Wayne ANGB is generally described as a military installation that includes runways, aircraft parking ramps, maintenance facilities (e.g., hangars), storage buildings, and operations/administrative buildings. The built resources included in the Proposed Action are primarily located within the ANGB boundaries. These resources are scattered across the entire facility. In addition, a few resources are associated with the runways to the west and southwest of the facility boundaries. Buildings, hangars, and ramps bound the airfield on the eastern and western sides of the runway. Bounding these facilities to the immediate north is a golf course and adjacent to that is an industrial/commercial area on the south side of Fort Wayne. The east and south are rural areas with a scattering of industrial buildings.

Basis of Consideration in this EA: The proposed facilities construction and renovation projects to accommodate the new F-16 mission would not involve lighting or intrusions that would affect the visual character of Fort Wayne ANGB or Fort Wayne International Airport. The construction and renovations would occur in developed areas of the installation and would be consistent with the existing visual landscapes of the installation and airport. The construction and renovation would be expected to have a negligible effect on visual resources.

Changes in aircraft flying over public lands would not occur at a lower altitude than the current A-10 aircraft and, therefore, would not result in undesirable visual intrusions to the public. Chaff and flare are already routinely used within the 122 FW flying areas, and the expenditures of chaff and flare under the Proposed Action would remain the same as current levels. A field study of the visibility of chaff and incidental debris in different environmental contexts concluded that significant aesthetic effects are unlikely. A survey of high-use areas did not indicate that chaff debris accumulates to create visual impacts; the potential for flare debris would be similar to chaff debris (ACC, 1997). For these reasons, visual resources were not carried forward for detailed analysis in this EA.

A.14 HISTORIC PROPERTIES

Cultural resources are governed by federal laws and regulations, including the **National Historic Preservation Act (NHPA)**, **Archeological and Historic Preservation Act**, **American Indian Religious Freedom Act**, **Archaeological Resources Protection Act of 1979**, and the **Native American Graves Protection and Repatriation Act of 1990**. Federal agencies' responsibility for

protecting historic properties is defined primarily by sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties. Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and subsequent presidential memoranda, direct federal agencies to interact on a government-to-government consultation with Indian Tribes. Cultural resources also may be covered by state, local, and territorial laws.

Basis of Consideration in this EA: Table A-5 details the known historic structures within two miles of Fort Wayne ANGB. Table A-6 lists the built resources at Fort Wayne ANGB and their NRHP eligibility determinations. Historic Properties are considered in Section 3.9 of this EA.

Table A-5 Previously Surveyed Architectural Resources Within Two Miles of the Project Area

Site Number	Property Name	Address	Description	NRHP Eligibility
023-215-10224	Horney Robinson House	7320 Lower Huntington Road	Single-family house	Listed
023-215-11030	John Branstrator Farm	7804 Lower Huntington Road	Farmstead	Potentially Eligible
003-215-28005	No name recorded	5621 Lower Huntington Road	Single-family house	Potentially Eligible
003-215-55130	No name recorded	2209 Drake Drive	Single-family house	Not Eligible
003-215-55143	Maplewood Elementary School	2200 Maplewood Road	School	Potentially Eligible
003-215-55229	No name recorded	7114 Ideal Avenue	Single-family house	Not Eligible
003-485-12007	Daniel S. Swank Farm	12302 Bluffton Road	Farm with ca. 1890 Gabled Ell farmhouse	Potentially Eligible
003-485-12010	Francis A. Fachs Farm	1305 Pleasant Center	Farmstead	Potentially Eligible
003-485-12011	Alconex Magnet Wire	4204 Ferguson Road	Industrial	Not Eligible
003-485-12012	Arden Company	3320 Ferguson Road	Industrial	Not Eligible

Site Number	Property Name	Address	Description	NRHP Eligibility
003-485-12013	Ardi, LLC	9801 Airport Drive	Commercial	Not Eligible
003-485-12014	Bridge	On Airport Expressway; ½ mile west on Bluffton Road over Harber Ditch	Single-span bridge	Not Eligible
003-485-12015	Bridge	Bluffton Road south of Winter Road over Harber Ditch	Single-span bridge	Not Eligible
003-485-12016	Bridge	Pleasant Center Road over Woods Ditch	Single-span bridge	Not Eligible
003-485-12018	No name recorded	11326 Smith Road	Single-family house	Not Eligible
003-485-12019	No name recorded	10727 Bluffton Road	Single-family house	Not Eligible
003-485-12020	No name recorded	10914 Bluffton Road	Single-family house	Not Eligible
003-485-12021	No name recorded	11320 Thiele Road	Single-family house	Not Eligible
003-485-12022	No name recorded	11605 Brookline Road	Single-family house	Not Eligible
003-485-12023	No name recorded	11615 Brookline Road	Single-family house	Not Eligible
003-485-12024	No name recorded	12003 Thiele Road	Single-family house	Not Eligible
003-485-12025	No name recorded	2307 Dunkelberg Road	Single-family house	Not Eligible
003-485-12026	No name recorded	2614 Ferguson Road	Single-family house	Not Eligible
003-485-12027	No name recorded	9403 Ardmore Road	Single-family house	Not Eligible
003-485-12028	No name recorded	9512 Bluffton Road	Single-family house	Not Eligible

Site Number	Property Name	Address	Description	NRHP Eligibility
003-485-12029	No name recorded	9720 Bluffton Road	Single-family house	Not Eligible
003-485-12030	International Paper	3904 Ferguson Road	Industrial	Not Eligible
003-485-12032	Jacob H. Kimmel Farm	9721 Coverdale Road	Farm with 1881 Foursquare	Eligible
003-485-12033	John Dalman Farm	1520 Ferguson Road	Farm with 1876 Italianate farmhouse	Not Eligible
003-485-12035	John M. Shive Farm	1606 Winters Road	Farm with ca. 1875 Italianate	Potentially Eligible
003-485-12036	Parsonage	6303 Winters Road	Single-family house	Not Eligible
003-485-12037	William Kennark Farm	1102 Ferguson Road	Farm with ca. 1905 Gabled Ell farmhouse	Not Eligible
003-485-12040	Nine Mile Methodist Cemetery	Winters and Bushkirk Roads	Cemetery, 1856–present	Not Eligible
003-485-12042	Sorg Farm	10924 Thiele Road	Farm with ca. 1915 Gabled Ell farmhouse	Not Eligible
003-485-12044	G. Heiser Farm	12511 Thiele Road	Farm with ca. 1890 Gabled Ell farmhouse	Not Eligible
003-485-12045	No name recorded	12326 Bluffton Road	Single-family house	Not Eligible
003-485-12050	No name recorded	1431 Ferguson Road	Single-family house	Not Eligible
003-485-12055	No name recorded	5512 Pleasant Center	Single-family house	Not Eligible
003-485-12059	No name recorded	4331 Winters Road	Racetrack	Not Eligible
003-485-12062	Spenn Farm	510 Pleasant Center	Farmstead	Not Eligible
003-485-12063	William M. Dafforn Farm	5024 Pleasant Center Road	Farm with ca. 1870 Queen Anne farmhouse	Not Eligible

Site Number	Property Name	Address	Description	NRHP Eligibility
003-485-12066	Nine Mile Methodist Church	Winters and Bushkirk Roads	1906/1959 Church	Not Eligible
003-485-12330	Hartman Body Shop	12330 Bluffton Road	Commercial/Industrial	Not Eligible
003-698-11017	Bridge	Coverdale Road north of Winters Road	Single-span Bridge	Not Eligible
003-698-11018	George Lopshire Farm	6812 Ferguson Road	C. 1890 Queen Anne farmhouse	Not Eligible
003-698-11023	No name recorded	6932 Winters Road	Farmstead	Potentially Eligible
003-698-11026	George W. Coverdale Farm	7315 Ferguson Road	Farmstead	Eligible
003-698-11035	William Fogwell Farm	7330 Ferguson Road	Farmstead	Eligible
003-698-11036	Albright Cemetery	Corner of Winters and Indianapolis Road	Cemetery	Not Eligible
003-698-11040	No name recorded	7625 Winters Road	C. 1890 single-family house	Not Eligible
003-698-11042	Lafayette Township School No. 6	7828 Lafayette Center Road	School	Potentially Eligible
003-698-11057	William Genth Farm	8509 Winters Road	Farmstead	Potentially Eligible

(TEC, Inc., 2009)

Table A-6 National Register of Historic Places Determinations for Fort Wayne ANGB

Facility Number	Year Built	Current Facility Name	NRHP Recommendation	Real Property Historic Status Code
300	1988	Civil Engineering Warehouse	Not Eligible	DNE
305	1942	Storage Igloo	Not Eligible	DNE
354	1981	POL Pump House	Not Eligible	DNE
356	1982	POL Maintenance/ Liquid Fuels	Not Eligible	DNE
734	1953	Aircraft Maintenance Hangar	Not Eligible	DNE

Facility Number	Year Built	Current Facility Name	NRHP Recommendation	Real Property Historic Status Code
740	1979	Avionics	Not Eligible	DNE
753	1982	Squadron Operations/ Communications	Not Eligible	DNE
755	1974	Corrosion Control Storage	Not Eligible	DNE
756	1974	Engine Shop	Not Eligible	DNE
758	1958	Welding Shop/Mobility	Not Eligible	DNE
764	1977	Weapons Upload	Not Eligible	DNE
766	1957	Disaster Preparedness	Not Eligible	DNE
768	1954	AGE Maintenance Shop	Not Eligible	DNE
780	1958	Wing Headquarters	Not Eligible	DNE
784	1985	Civil Engineering	Not Eligible	DNE
794	1987	Emergency Management	Not Eligible	DNE
796	1984	West Gate House	Not Eligible	DNE
798	1976	Motor Pool	Not Eligible	DNE

(TEC, Inc., 2009)
Key: DNE = Determined Not Eligible

A.15 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomics includes the basic attributes and resources associated with the human environment, particularly population and economic activity (to include employment, personal income, and industrial growth). Impacts on these socioeconomic indicators can influence other components such as housing availability and public services.

Fort Wayne ANGB is located in the city of Fort Wayne within Allen County, Indiana. In 2019, Fort Wayne had a population of 270,402 and Allen County had a population of 379,299. Both the city and county populations increased at the same rate from 2010 to 2019 (6.6 percent growth within Fort Wayne and 6.7 percent growth in Allen County. There were an estimated 160,704 housing units in Allen County in 2019 of which approximately 146,280 (91.0 percent of the total housing supply) were occupied. In 2019, the median owner-occupied housing value was $129,300 in Allen County and $115,100 in Fort Wayne. The 2019 median rent was $773 in Allen County and $764 in Fort Wayne (U.S. Census Bureau, 2019).

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires federal agencies to consider the human health and environmental conditions in minority and low-income communities to ensure that any disproportionately high and adverse human health or environmental effects on these communities are identified and addressed.

A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is notably greater than in the general population (CEQ, 1997). Low-income populations are identified using the Census Bureau's statistical poverty threshold, which is based on income and

family size. The poverty threshold for a family of four in 2020 is $26,246; although this number varies based on the amount of people and dependents within a family unit (USEPA, 2020). The Census Bureau defined a "poverty area as a Census Tract (CT) where 20 percent or more of the residents have incomes below the poverty threshold; an "extreme poverty area" is a CT with 40 percent or more below the poverty level (U.S. Census Bureau, 1995).

Table A-7 shows the demographic information on race, ethnicity, and poverty status in the areas that would experience noise impacts from the Proposed Action. For the environmental justice analysis, demographics are analyzed at the census tracts level to get a better picture of the impacted population. Information for Allen County and the United States are provided for context. The poverty rates within the region are equal to or lower than the poverty rates in the overall county and the United States. Minority populations are similar or lower than those populations within the county and United States with the exception of CT 39.02, which has a higher percentage of Black residents as compared with the county and United States. This CT contains the Residences at Redwood Circle area of interest that was investigated within the noise analysis (Section 3.6). Noise impacts would not be significant.

Table A-7 Minority and Low-Income Population Characteristics Surrounding Fort Wayne ANGB (2019)

Geographic Area	Percent White[1]	Percent Black[1]	Percent Hispanic or Latino[2]	Percent Asian or Pacific Islander	Percent American Indian or Alaska Native	Percent of Individuals Below Poverty Level
CT 39.01	91.2%	6.7%	4.9%	0.0%	0.0%	8.9%
CT 39.02	66.2%	24.9%	14.8%	0.0%	0.0%	12.9%
CT 115.02	83.3%	4.9%	4.4%	1.6%	0.0%	13.4%
CT 116.05	86.4%	2.6%	3.1%	3.8%	0.2%	2.7%
CT 117.01	95.2%	0.4%	1.6%	1.2%	0.0%	5.5%
CT 117.02	82.1%	7.7%	11.0%	4.1%	0.0%	5.8%
Allen County	78.9%	11.5%	7.5%	3.8%	0.2%	13.3%
United States	72.5%	12.7%	18.0%	5.7%	0.8%	13.4%

(U.S. Census Bureau, 2019)
Notes: 2019 data is the most recent data available from the U.S. Census Bureau.
[1] Non-Hispanic or Latino
[2] Of any race
Key: CT = Census Tract.

Basis of Consideration in this EA: The Proposed Action would not result in noticeable changes in the human environment under the SUA utilized by the 122 FW, so the populations under the airspace would not be expected to experience any impacts on socioeconomics from the Proposed Action.

Implementation of the Proposed Action could result in negligible-to-minor short-term benefits to socioeconomics within the region related to temporary construction-related employment and expenditures. Under the Proposed Action, an estimated 100 additional personnel would report to Fort Wayne ANGB, some with dependents, who would be expected to relocate to the Fort Wayne region. The personnel increase would not have a substantial effect on the local population and the capacity for existing houses, schools, and emergency services within the city of Fort Wayne and Allen

County, which have a population of over 270,400 and 379,000, respectively. Therefore, socioeconomics is not carried forward for detailed analysis in this EA.

All construction, demolition, and renovation activities associated with the Proposed Action would take place within the boundaries of Fort Wayne ANGB and would not affect local populations. The changes in noise contours associated with the conversion to F-16 aircraft would result in a change to the noise contours associated with the installation flying operations. As discussed in Section 3.6, Noise, residences that would experience noise impacts would not experience an increase at or above the significance thresholds and thus would not experience significant impacts from noise. CT 39.02, which has a higher percentage of Black residents, includes the Residences at Redwood Circle area of interest that was investigated within the noise analysis (Section 3.6). These residences would experience a noise increase of 0.5 dBA, and noise would remain below 65 dBA DNL. The increased noise is not considered significant for residential locations, as increases in noise would be experienced at higher levels among other points of interest, and the impacts to this CT would not be disproportionately adverse. There are no low-income populations within the CTs that would be impacted by the Proposed Action. No disproportionate impacts on minority and low-income populations would be expected under the Proposed Action. Therefore, Environmental Justice is not carried forward for detailed analysis in this EA.

Fort Wayne ANGB is a secure installation. Because children are not present, they would not be impacted by the proposed construction, demolition, and renovation projects. Implementation of the Proposed Action would not result in an increased exposure of children to environmental health or safety risks, such as those associated with the generation, use, or storage of hazardous materials. Noise impacts to the areas near the airport and the anticipated F-16 noise contours, including the school located approximately 2.5 miles from the installation, are expected to be minor and are analyzed further in Section 3.6, Noise. Therefore, Children's Environmental Health and Safety Risks are not carried forward for detailed analysis in this EA.

A.16 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

In general, both hazardous materials and wastes include substances that might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed. Substances may be considered dangerous because of their quantity; concentration; or physical, chemical, or infectious characteristics.

Evaluation of hazardous materials and wastes focuses on the storage, handling, use, transport, and disposal of these substances. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of hazardous materials or wastes, the extent of contamination varies based on the type of soil, topography, and water resources.

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173." U.S. Department of Transportation regulations govern the transportation of hazardous materials. The **Emergency Planning and Community Right-to-Know Act (EPCRA)** requires federal, state, local, and tribal governments and industrial facilities to report

on the storage use, and releases of hazardous substances to federal, state, local and tribal governments, to prepare for potential chemical accidents, improve safety, and protect public health and the environment.

Hazardous wastes are defined by the **Resource Conservation and Recovery Act (RCRA)**, as amended by the **Hazardous and Solid Waste Amendments**, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Universal wastes are a subset of hazardous wastes that are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials, as specified in 40 CFR 273. Five types of waste are currently covered under the universal wastes regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, hazardous waste lamps such as fluorescent light bulbs, and hazardous waste aerosol cans.

Special hazards are substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate special hazard substances by the **Toxic Substances Control Act (TSCA)**. Asbestos is also regulated by USEPA under the **Clean Air Act** and the **Comprehensive Environmental Response, Compensation, and Liability Act**.

The **Pollution Prevention Act** focused industry, government, and public attention on reducing the amount of pollution through cost-effective changes in production, operation, and raw materials use. Pollution prevention includes source reduction; practices that increase efficiency in the use of energy, water, or other natural resources; and practices that protect our resource base through conservation.

Basis of Consideration in this EA: The conversion from A-10 aircraft to F-16 aircraft would necessitate storage of H-70 (an aqueous solution of 70 percent hydrazine and 30 percent water). Hydrazine is an Extremely Hazardous Substance as defined in Section 304 of the **Emergency Planning and Community Right-to-Know Act (EPCRA)**. Accordingly, impacts related to hazardous materials, solid waste, and pollution prevention are considered in Section 3.10 of this EA.

A.17 Consistency of this Proposed Action with Federal, State, and Local Laws, Plans, Policies, and Regulation

Table A-8 summarizes potentially applicable laws, regulations, and policies, including those statutes that are often considered in EAs but not applicable to this Proposed Action.

Table A-8 Summary of Potentially Applicable Laws, Regulations, and Policies

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance	EA Sections for Further Information
Bald and Golden Eagle Protection Act (16 USC section 668–668d)	By design, Fort Wayne ANGB provides very poor wildlife habitat, and the Proposed Action would not negatively affect eagles or other wildlife. Continued adherence to the 122 FW BASH Plan would minimize potential hazards to eagles and other birds.	Biological Resources/ Section 3.8
Clean Air Act (42 USC section 7401 et seq.)	All the counties in the project area are in attainment for criteria pollutants. Therefore, the General Conformity Rule does not apply.	Air Quality/Section 3.4, Appendix E
Clean Water Act (33 USC section 1251 et seq.)	Project is currently under review with U.S. Army Corps of Engineers.	Water Resources/ Section 3.7
Coastal Zone Management Act (16 USC section 1451 et seq.)	Not applicable. The Proposed Action would not occur near or affect coastal resources.	Coastal Resources/ Appendix A, A.5
Comprehensive Environmental Response, Compensation, and Liability Act (42 USC section 9601 et seq.)	Not applicable. The Proposed Action would not affect any CERCLA Superfund sites.	Hazardous Materials, Solid Waste, and Pollution Prevention/Section 3.10
Department of Transportation Act Section 4(f) (49 USC Section 303)	Not applicable. Military flight operations and designation of airspace for such operations are exempt for Public Law 105-85.	Department of Transportation Act Section 4(f)/Appendix A, A.6
Emergency Planning and Community Right-to-Know Act (42 USC sections 11001–11050)	Reporting of hydrazine would occur pursuant to EPCRA requirements.	Hazardous Materials, Solid Waste, and Pollution Prevention/Section 3.10
Federal Insecticide, Fungicide, and Rodenticide Act (7 USC section 136 et seq.)	Not applicable. The Proposed Action would not require changes in the use of any pesticides or pesticide-treated products.	—
Endangered Species Act (16 USC section 1531 et seq.)	No effect on any federal-listed threatened or endangered species or critical habitat would occur.	Biological Resources/ Section 3.8
Farmland Protection Policy Act (7 USC 4201 et seq.)	Not applicable. The soils on Fort Wayne ANGB are previously disturbed.	Geological Resources/ Appendix A, A.9

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance	EA Sections for Further Information
NEPA (42 USC sections 4321–4370h) CEQ-NEPA implementing regulations (40 CFR parts 1500–1508) DAF EIAP (32 CFR 989) AFI 32-1015 FAA Environmental Impacts: Policies and Procedures (FAA Order 1050.1F)	This EA is being prepared to comply with NEPA, as implemented by the CEQ, DAF, and FAA implementing regulations.	Entire EA is prepared to comply with NEPA
National Historic Preservation Act (54 USC section 306108 et seq.)	No National Historic Preservation Act-eligible architectural structures are located within the project area. Section 106 consultation is forthcoming.	Historic Properties/ Section 3.9
Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (16 USC section 1801 et seq.)	Not applicable. The Proposed Action would not affect essential fish habitat.	—
Marine Mammal Protection Act (16 USC section 1361 et seq.)	Not applicable. The Proposed Action would not affect marine mammals.	—
Migratory Bird Treaty Act (16 USC section 703–712)	All proposed activities would use the guidelines already established in the Fort Wayne ANGB Bird/Wildlife Aircraft Strike Hazard Plan to minimize potential effects on migratory birds.	Biological Resources/ Section 3.8
Pollution Prevention Act (42 USC 13101[b])	The Proposed Action would result in negligible long-term changes in waste streams.	Hazardous Materials, Solid Waste, and Pollution Prevention/Section 3.10
Resource Conservation and Recovery Act (42 USC section 6901 et seq.)	No changes would occur in the way that hazardous wastes are handled, stored, or disposed of, pursuant to requirements. In the unlikely event of a release, disposal of hydrazine would occur in accordance with regulations.	Hazardous Materials, Solid Waste, and Pollution Prevention/Section 3.10
Toxic Substances Control Act (15 USC sections 2601–2629)	Reporting of chemical substances would remain pursuant to requirements.	Hazardous Materials, Solid Waste, and Pollution Prevention/Section 3.10

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance	EA Sections for Further Information
Wild and Scenic Rivers Act (16 USC 1271 et seq)	No Wild or Scenic Rivers are within the study area where ground-disturbing activities would occur.	Water Resources/ Section 3.7
Executive Order 11988, Floodplain Management, May 24, 1977	The Proposed Action is not located within any identified flood hazard zones.	Water Resources/ Section 3.7
Executive Order 11990, Protection of Wetlands, May 24, 1977	No jurisdictional wetlands are present within the study area.	Water Resources/ Section 3.7
Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, February 11, 1994	The Proposed Action is not expected to disproportionately affect minority or low-income populations.	Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks/ Appendix A, A.15
Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, April 21, 1997	The Proposed Action is not expected to disproportionately affect children.	Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks/ Appendix A, A.15
Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, November 6, 2000	No traditional cultural properties are known to be located on Fort Wayne ANGB. Scoping letters were sent to potentially affecting tribes; tribes will also be included in forthcoming Section 106 consultation.	Historic Properties/ Section 3.9

(FAA, 2020a)

Key: AFI = Air Force Instruction; ANGB = Air National Guard Base; CEQ = Council on Environmental Quality; CFR = Code of Federal Regulations; EIAP = Environmental Impact Analysis Process; FAA = Federal Aviation Administration; NEPA = National Environmental Policy Act; USC = United States Code; DAF = Department of the Air Force.

APPENDIX B
INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Distribution List

Name	Agency/Organization
Mike Braun, United States Senator	Senator, Indiana
Todd Young, United States Senator	Senator, Indiana
Jim Banks, United States Representative	3rd District, Indiana
Eric Holcomb, Governor of Indiana	State of Indiana
	Allen County, IN Board of Commissioners
Kellie Streeter, President	Board of Commissioners of Knox County, IN
Robert Davis, President	Board of Commissioners of Sullivan County, IN
Gerald Bledsoe, President	Board of Commissioners of Gibson County, IN
Olivia Baumgardner	Greater Wabash Regional Planning Commission
	Crawford County, IN Board of Commissioners
Joe Goodman, Chairman	Board of Clay County, IL
Ronald Heltsley, Chairman	Board of Jasper County, IL
Bryan Lewis, President	Board of Commissioners of Fulton County, IN
Alan Hunt, Chairman	Board of Commissioners of Miami County, IN
Paul Wyman, President	Board of Commissioners of Howard County, IN
Josh Uitts, President	Board of Commissioners of Clinton County, IN
William Brown, Chairman	Board of Commissioners of Carroll County, IN
Ralph Anderson, President	Board of Commissioners of Cass County, IN
Tracy Brown, President	Board of Commissioners of Tippecanoe, IN
	White County, IN Board of Commissioners
Charles Mellon, President	Board of Commissioners of Pulaski County, IN
	Fayette County, OH Commissioners
	Clinton County, OH Commissioners
Jeff Duncan, President	Board of Commissioners of Highland County, OH
	Brown County, OH Commissioners
	Adams County, OH Commissioners
Bryan Davis, Chairman	Scioto County, OH Commissioners
Tony Montgomery, Chairman	Board of Commissioners of Pike County, OH
	Ross County, OH Commissioners
Brian Baird, Chairman	Board of Commissioners of Johnson County, IN
Carl Lienhoop, Chairman	Board of Commissioners of Bartholomew County, IN
	Brown County, IN Board of Commissioners
Matt Reedy, President	Board of Commissioners of Jackson County, IN
Phillip Marshall, President	Board of Commissioners of Washington County, IN
Mike Jones, President	Board of Commissioners of Scott County, IN
David Bramer, President	Board of Commissioners of Jefferson County, IN
Matt Sporleder, President	Board of Commissioners of Jennings County, IN
Elizabeth McCloskey	U.S. Fish and Wildlife Servie
Supervisor	U.S. Army Corps of Engineers
	City of Fort Wayne Community Development Division
Beth McCord, Deputy State Historic Preservation Officer	Indiana Department of Natural Resources Division of Historic Preservation and Archaeology
Amanda Wuestefeld, Director	Indiana Department of Natural Resources Division of Fish and Wildlife

Jessica Merkling, Biologist	Indiana Department of Natural Resources Division of Fish and Wildlife, Northeast Regional Office
Ryan Mueller,	Indiana Department of Natural Resources Division of Water
Bruno Pigott, Commissioner	Indianapolis Department of Environmental Management Indianapolis Central Office
Todd Johnson, Deputy Commissioner	Indiana Department of Transportation Fort Wayne District
	Indiana Department of Environmental Management Office of Water Quality
	Indiana Department of Environmental Management Office of Pollution Prevention
	Indiana Department of Environmental Management Office of Air Quality
James Kinder, Program Manager Aviation	Indiana Department of Transportation
Mike Wefer, Chief	Illinois Department of Natural Resources Division of Wildlife Resources
Kendra Wecker, Chief	Ohio Department of Natural Resources Division of Wildlife
	Back 40 Flying Club, Aircraft Owners and Pilots Association Fort Wayne International Airport
Steve Hadley,	National Business Aviation Association Southwest Central Region
	American Wind Energy Association
Name	**Tribe**
John Barrett, Chairman Kelli Mosteller, THPO	Citizen Potawatomi Nation, Oklahoma
Glenna Wallace, Chief Paul Barton, THPO	Eastern Shawnee Tribe of Oklahoma
Ned Daniels, Chairman Michael LaRonge, THPO	Forest County Potawatomi Community of Wisconsin
Kenneth Meshigaud, Chairperson Earl Meshigaud, THPO	Hannahville Indian Community, Michigan
Douglas Lankford, Chief Julie Olds, THPO	Miami Tribe of Oklahoma
Benjamin Barnes, Chief Tonya Tipton, THPO	Shawnee Tribe
Ethel Cook, Chief Rhonda Dixon, THPO	Ottawa Tribe of Oklahoma
Craig Harper, Chief Logan Pappenfort, THPO	Peoria Tribe of Indians of Oklahoma
Joseph Rupnick, Chairperson Raphael Wahwassuck, THPO	Prairie Band of Potawatomi Nation
Billy Friend, Chief Sherri Clemons, THPO	Wyandotte Nation
Brian Buchanan, Chief John Dunnagan, Historic and Cultural Preservation Office	Miami Nation of Indians of Indiana

Terry Stuff, Chief	Wea Indian Tribe of Indiana
Matthew Wesaw, Chairperson Matthew Bussler, THPO	Pokagon Band of Potawatomi Indians
John Johnson, Governor Devon Fraizer, THPO	Absentee Shawnee Tribe of Oklahoma
Chester "Chet" Brooks, Chief Brice Obermeyer, THPO	Delaware Tribe of Indians
Juan Garza, Chairman	Kickapoo Traditional Tribe of Texas
Lester Randall, Chairman	Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas
Estavia Elondo, Chairman Kent Collier, NAGPRA	Kickapoo Tribe of Oklahoma

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS 20762-5157

June 1, 2021

Alana M. Olson
NEPA Program Manager
National Guard Bureau (NGB/A4AM)
3501 Fetchet Avenue
Joint Base Andrews MD 20762

Ms. Elizabeth McCloskey
United States Fish and Wildlife Service
Northern Indiana Ecological Services Suboffice
PO Box 2616
Chesterton IN 46304-9753

Dear Ms. McCloskey:

The National Guard Bureau (NGB) is preparing an Environmental Assessment (EA) to investigate a proposed aircraft mission conversion from A-10 aircraft to F-16 aircraft for the Indiana Air National Guard (ANG) 122nd Fighter Wing (122 FW), located at Fort Wayne Air National Guard Base (ANGB), Fort Wayne, Indiana (Attachment 1). Under the Proposed Action, all A-10 mission aircraft would be phased out and replaced with one fighter squadron of 24 F-16 aircraft. This would include minimal operational changes at the airfield and Special Use Airspace (SUA); the modification of the times of use of Restricted Area (R-) 3403B to allow for scheduled use of the airspace outside of the currently designated times through a Notice to Airmen (NOTAM); an increase of approximately 100 personnel; and the construction and structural improvement projects necessary to facilitate the full mission conversion requirements. The F-16 mission would utilize operations and training airspace currently used by the 122 FW A-10 mission (shown in Attachment 1). The mission transition is planned for Fiscal Year (FY) 2023.

The Proposed Action is needed to support the objectives outlined in Section 134, part (f) Special Rule, National Defense Authorization Act (NDAA) FY17, H.R. 4909 (Report No. 114-537, Public Law 114-328), which allows for the transition of the A-10 unit to an F-16 unit at Fort Wayne ANGB. The Proposed Action is also needed to support the primary federal mission of the 122 FW, which is to achieve and maintain the level of operational readiness that will provide trained and equipped combat-ready tactical units, capable of global deployment, ready for immediate integration into the active Air Force to assure air offense, air defense, or joint action with ground forces. As directed by the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations and the U.S. Air Force's Environmental Impact Analysis Process (EIAP), the NGB is preparing an EA to investigate impacts to the human health and the natural environment associated with the Proposed Action. The Federal Aviation Administration is acting as a cooperating agency.

The Proposed Action would return 122 FW to its previous F-16 mission through a full replacement of 21 A-10 mission aircraft to one fighter squadron (24 Primary Aircraft Authorizations [PAA]) of F-16 aircraft. The F-16 mission would utilize existing operations and training airspace and ranges used by the 122 FW A-10 aircraft (Attachment 1), and operations would increase slightly from 4,032 to 4,400 annual operations due to F-16 mission requirements. The R-3403B current time of designation (airspace availability) is published as 0800 to 2300, local time; the Proposed Action would keep the published time of designation hours the same but add a stipulation that the airspace could be scheduled at other times on a case-by-case basis by NOTAM. The primary purpose of this is to allow R-3403B to support flying operations during the time of designations for the adjacent R-3403A, which is 0630 to 2400, local time. Chaff and flares are currently used by 122 FW and would continue to be used under the Proposed Action at existing levels and locations.

To meet manpower requirements of the proposed F-16 mission conversion, the Proposed Action would result in an increase of 100 personnel. Approximately 90 percent of these personnel would report to the installation for the 122 FW two-day training drill typically conducted once per month, and approximately 10 percent would report to the installation full-time. The 122 FW has identified 17 infrastructure projects needed to satisfy the requirements of the F-16 mission conversion, listed in Attachment 2 and depicted in Attachment 3.

The NGB obtained a species list through the ECOS-IPaC system on February 3, 2021 (Attachment 4). The report showed that the proposed project area is within the range of the endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*). Two species of migratory birds protected under the Migratory Bird Treaty Act have the potential to occur at Fort Wayne ANGB. Species surveys of the installation are being conducted in the spring of 2021 to further determine if preferred habitat for listed species exists within the project boundary.

The NGB and 122 FW are interested in information or agency-specific preliminary comments that would alleviate or highlight areas of concerns preceding this EA. The NGB and 122 FW request information on any additional species of concern or any information that your agency may have regarding other proposed, ongoing, or recently completed projects that could create or exacerbate impacts related to the Proposed Action.

Please respond with any comments you may have within thirty (30) days of receipt of this letter to Ms. Alana Olson, ATTN: 122 FW EA, 3501 Fetchet Avenue, Joint Base Andrews, MD 20762-5157 or by email at NGB.A4.A4A.NEPA.COMMENTS.Org@us.af.mil with the subject titled as ATTN: 122 FW EA. Thank you for your assistance.

Sincerely

OLSON.ALANA.MAHARREY.1297265764

Digitally signed by OLSON.ALANA.MAHARREY.1297265764
Date: 2021.06.01 17:21:33 -04'00'

ALANA M. OLSON
GS-13, DAF
NEPA Program Manager

Five Attachments:

1. 122 FW ANG and Airspace Location Map, March 2021
2. 122 FW Infrastructure Project List, March 2021
3. 122 FW Infrastructure Project Location Maps, March 2021
4. USFWS IPaC Resources, February 3, 2021
5. 122 FW EA Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Distribution List

NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS 20762-5157

June 1, 2021

Jennifer L. Harty
Cultural Resources Program Manager
National Guard Bureau (NGB/A4V)
3501 Fetchet Avenue
Joint Base Andrews MD 20762

Ms. Beth McCord, Director
Deputy State Historic Preservation Officer
Department of Natural Resources
Division of Historic Preservation and Archaeology
402 W. Washington Street, Room W274
Indianapolis IN 46204

REFERENCE: National Environmental Policy Act Environmental Assessment for the Fort Wayne Air National Guard Base

Dear Ms. McCord

The National Guard Bureau (NGB) is preparing an Environmental Assessment (EA) to investigate a proposed aircraft mission conversion from A-10 aircraft to F-16 aircraft for the Indiana Air National Guard (ANG) 122nd Fighter Wing (122 FW), located at Fort Wayne Air National Guard Base (ANGB), Fort Wayne, Indiana (Attachment 1). Under the Proposed Action, all A-10 mission aircraft would be phased out and replaced with one fighter squadron of 24 F-16 aircraft. This would include minimal operational changes at the airfield and Special Use Airspace (SUA); the modification of the times of use of Restricted Area (R-) 3403B to allow for scheduled use of the airspace outside of the currently designated times through a Notice to Airmen (NOTAM); an increase of approximately 100 personnel; and the construction and structural improvement projects necessary to facilitate the full mission conversion requirements. The F-16 mission would utilize operations and training airspace currently used by the 122 FW A-10 mission (shown in Attachment 1). The mission transition is planned for Fiscal Year (FY) 2023.

The Proposed Action is needed to support the objectives outlined in Section 134, part (f) Special Rule, National Defense Authorization Act (NDAA) FY17, H.R. 4909 (Report No. 114-537, Public Law 114-328), which allows for the transition of the A-10 unit to an F-16 unit at Fort Wayne ANGB. The Proposed Action is also needed to support the primary federal mission of the 122 FW, which is to achieve and maintain the level of operational readiness that will provide trained and equipped combat-ready tactical units, capable of global deployment, ready for immediate integration into the active Air Force to assure air offense, air defense, or joint action with ground forces. As directed by the National Environmental Policy Act (NEPA) of 1969, as

implemented by the Council on Environmental Quality (CEQ) regulations and the U.S. Air Force's Environmental Impact Analysis Process (EIAP), the NGB is preparing an EA to investigate impacts to the human health and the natural environment associated with the Proposed Action. The Federal Aviation Administration is acting as a cooperating agency.

The Proposed Action would return 122 FW to its previous F-16 mission through a full replacement of 21 A-10 mission aircraft to one fighter squadron (24 Primary Aircraft Authorizations [PAA]) of F-16 aircraft. The F-16 mission would utilize existing operations and training airspace and ranges used by the 122 FW A-10 aircraft (Attachment 1) and operations would increase slightly from 4,032 to 4,400 annual operations due to F-16 mission requirements. The R-3403B current time of designation (airspace availability) is published as 0800 to 2300, local time; the Proposed Action would keep the published time of designation hours the same but add a stipulation that the airspace could be scheduled at other times on a case-by-case basis by NOTAM. The primary purpose of this is to allow R-3403B to support flying operations during the time of designations for the adjacent R-3403A, which is 0630 to 2400, local time. Chaff and flares are currently used by 122 FW and would continue to be used under the Proposed Action at existing levels and locations.

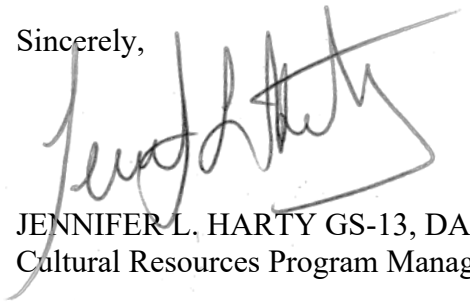
To meet manpower requirements of the proposed F-16 mission conversion, the Proposed Action would result in an increase of 100 personnel. Approximately 90 percent of these personnel would report to the installation for the 122 FW two-day training drill typically conducted once per month, and approximately 10 percent would report to the installation full-time. The 122 FW has identified 17 infrastructure projects needed to satisfy the requirements of the F-16 mission conversion, listed in Attachment 2 and depicted in Attachment 3.

The NGB and 122 FW are interested in information or agency-specific preliminary comments that would alleviate or highlight areas of concerns preceding this EA. Areas of concern may include potential effects to physical, ecological, social, cultural, archaeological, and tribal resources. The NGB and 122 FW also request any information that your agency may have regarding other proposed, ongoing, or recently completed projects that could create or exacerbate impacts related to the Proposed Action.

The NGB is preparing a National Historic Preservation Act Section 106 Review Request Submittal which will be submitted later. This letter is to provide you with information on the proposed undertaking and the intent to prepare the EA.

Please respond with any comments you may have within thirty (30) days of receipt of this letter to Jennifer Harty, Cultural Resources Program Manager (A4), ATTN: 122 FW EA, 3501 Fetchet Avenue, Joint Base Andrews, MD 20762-5157 or by email at NGB.A4.A4A.NEPA.COMMENTS.Org@us.af.mil with the subject titled as ATTN: 122 FW EA. Thank you for your assistance.

Sincerely,



JENNIFER L. HARTY GS-13, DAF
Cultural Resources Program Manager

Four Attachments:

1. 122 FW ANG and Airspace Location Map, March 2021
2. 122 FW Infrastructure Project List, March 2021
3. 122 FW Infrastructure Project Location Maps, March 2021
4. 122 FW EA Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Distribution List

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 122D FIGHTER WING (ACC)
3005 W. FERGUSON ROAD
FORT WAYNE INTERNATIONAL AIRPORT (IAP), IN 46809-3158

3 June 2021

Colonel Michael D. Stohler, USAF
Commander
122d Fighter Wing
3005 W Ferguson Rd
Fort Wayne, IN 46809

The Honorable John Barrett
Chairman
Citizen Potawatomi Nation, Oklahoma
1601 South Gordon Cooper Drive
Shawnee, OK 74801

Dear Chairman Barrett

The National Guard Bureau (NGB) is preparing an Environmental Assessment (EA) to investigate a proposed aircraft mission conversion from A-10 aircraft to F-16 aircraft for the Indiana Air National Guard (ANG) 122nd Fighter Wing (122 FW), located at Fort Wayne Air National Guard Base (ANGB), Fort Wayne, Indiana (Attachment 1). Under the Proposed Action, all A-10 mission aircraft would be phased out and replaced with one fighter squadron of 24 F-16 aircraft. This would include minimal operational changes at the airfield and Special Use Airspace (SUA); the modification of the times of use of Restricted Area (R-) 3403B to allow for scheduled use of the airspace outside of the currently designated times through a Notice to Airmen (NOTAM); an increase of approximately 100 personnel; and the construction and structural improvement projects necessary to facilitate the full mission conversion requirements. The F-16 mission would utilize operations and training airspace currently used by the 122 FW A-10 mission (shown in Attachment 1). The mission transition is planned for Fiscal Year (FY) 2023.

The Proposed Action is needed to support the objectives outlined in Section 134, part (f) Special Rule, National Defense Authorization Act (NDAA) FY17, H.R. 4909 (Report No. 114-537, Public Law 114-328), which allows for the transition of the A-10 unit to an F-16 unit at Fort Wayne ANGB. The Proposed Action is also needed to support the primary federal mission of the 122 FW, which is to achieve and maintain the level of operational readiness that will provide trained and equipped combat-ready tactical units, capable of global deployment, ready for immediate integration into the active Air Force to assure air offense, air defense, or joint action with ground forces. As directed by the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations and the U.S. Air Force's Environmental Impact Analysis Process (EIAP), the NGB is preparing an EA to investigate impacts to the human health and the natural environment associated with the Proposed Action. The Federal Aviation Administration is acting as a cooperating agency.

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The NGB and 122 FW respectfully request any information or preliminary comments that would alleviate or highlight areas of concerns preceding this EA. Areas of concern may include potential effects to: physical, ecological, social, cultural, archaeological, and tribal resources. The NGB and 122 FW also request any information that you may have regarding other proposed, ongoing, or recently completed projects that could create or exacerbate impacts related to the Proposed Action.

The NGB is also preparing a letter to initiate National Historic Preservation Act Section 106 consultation, which will be submitted to you later. This letter is to provide you with information on the proposed undertaking and the intent to prepare the EA.

Please respond with any initial comments you may have within thirty (30) days of receipt of this letter to Jennifer Harty, Cultural Resources Program Manager (A4), ATTN: 122 FW EA, 3501 Fetchet Avenue, Joint Base Andrews, MD 20762-5157 or by email at NGB.A4.A4A.NEPA.COMMENTS.Org@us.af.mil with the subject titled as ATTN: 122 FW EA. Thank you for your assistance.

Sincerely

MICHAEL D. STOHLER, Colonel, IN ANG
Commander, 122d Fighter Wing

Four Attachments:

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NATIONAL GUARD BUREAU
3501 FETCHET AVENUE
JOINT BASE ANDREWS 20762-5157

June 1, 2021

Alana M. Olson
NEPA Program Manager
National Guard Bureau (NGB/A4AM)
3501 Fetchet Avenue
Joint Base Andrews MD 20762

The Honorable Mike Braun
United States Senator
203 East Berry Street
Suite 702B
Fort Wayne IN 46802

Dear Senator Braun

The National Guard Bureau (NGB) is preparing an Environmental Assessment (EA) to investigate a proposed aircraft mission conversion from A-10 aircraft to F-16 aircraft for the Indiana Air National Guard (ANG) 122nd Fighter Wing (122 FW), located at Fort Wayne Air National Guard Base (ANGB), Fort Wayne, Indiana (Attachment 1). Under the Proposed Action, all A-10 mission aircraft would be phased out and replaced with one fighter squadron of 24 F-16 aircraft. This would include minimal operational changes at the airfield and Special Use Airspace (SUA); the modification of the times of use of Restricted Area (R-) 3403B to allow for scheduled use of the airspace outside of the currently designated times through a Notice to Airmen (NOTAM); an increase of approximately 100 personnel; and the construction and structural improvement projects necessary to facilitate the full mission conversion requirements. The F-16 mission would utilize operations and training airspace currently used by the 122 FW A-10 mission (shown in Attachment 1). The mission transition is planned for Fiscal Year (FY) 2023.

The Proposed Action is needed to support the objectives outlined in Section 134, part (f) Special Rule, National Defense Authorization Act (NDAA) FY17, H.R. 4909 (Report No. 114-537, Public Law 114-328), which allows for the transition of the A-10 unit to an F-16 unit at Fort Wayne ANGB. The Proposed Action is also needed to support the primary federal mission of the 122 FW, which is to achieve and maintain the level of operational readiness that will provide trained and equipped combat-ready tactical units, capable of global deployment, ready for immediate integration into the active Air Force to assure air offense, air defense, or joint action with ground forces. As directed by the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations and the U.S. Air Force's Environmental Impact Analysis Process (EIAP), the NGB is preparing an EA to investigate impacts to the human health and the natural environment associated with the Proposed Action. The Federal Aviation Administration is acting as a cooperating agency.

The Proposed Action would return 122 FW to its previous F-16 mission through a full replacement of 21 A-10 mission aircraft to one fighter squadron (24 Primary Aircraft Authorizations [PAA]) of F-16 aircraft. The F-16 mission would utilize existing operations and training airspace and ranges used by the 122 FW A-10 aircraft (Attachment 1), and operations would increase slightly from 4,032 to 4,400 annual operations due to F-16 mission requirements. The R-3403B current time of designation (airspace availability) is published as 0800 to 2300, local time; the Proposed Action would keep the published time of designation hours the same but add a stipulation that the airspace could be scheduled at other times on a case-by-case basis by NOTAM. The primary purpose of this is to allow R-3403B to support flying operations during the time of designations for the adjacent R-3403A, which is 0630 to 2400, local time. Chaff and flares are currently used by 122 FW and would continue to be used under the Proposed Action at existing levels and locations.

To meet manpower requirements of the proposed F-16 mission conversion, the Proposed Action would result in an increase of 100 personnel. Approximately 90 percent of these personnel would report to the installation for the 122 FW two-day training drill typically conducted once per month, and approximately 10 percent would report to the installation full-time. The 122 FW has identified 17 infrastructure projects needed to satisfy the requirements of the F-16 mission conversion, listed in Attachment 2 and depicted in Attachment 3.

The NGB and 122 FW are interested in information or agency-specific preliminary comments that would alleviate or highlight areas of concerns preceding this EA. Areas of concern may include potential effects on physical, ecological, social, cultural, and archaeological resources. The NGB and 122 FW also request any information that your agency may have regarding other proposed, ongoing, or recently completed projects that could create or exacerbate impacts related to the Proposed Action.

Please respond with any comments you may have within thirty (30) days of receipt of this letter to Ms. Alana Olson, ATTN: 122 FW EA, 3501 Fetchet Avenue, Joint Base Andrews, MD 20762-5157 or by email at NGB.A4.A4A.NEPA.COMMENTS.Org@us.af.mil with the subject titled as ATTN: 122 FW EA. Thank you for your assistance.

Sincerely

OLSON.ALANA.MAHARREY.1297265764

Digitally signed by OLSON.ALANA.MAHARREY.1297265764
Date: 2021.06.01 17:17:01 -04'00'

ALANA M. OLSON
GS-13, DAF
NEPA Program Manager

Four Attachments:

1. 122 FW ANG and Airspace Location Map, March 2021
2. 122 FW Infrastructure Project List, March 2021
3. 122 FW Infrastructure Project Location Maps, March 2021
4. 122 FW EA Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Distribution List

United States Department of the Interior
Fish and Wildlife Service

Indiana Field Office (ES)
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273

July 15, 2021

Ms. Alana Olson
NEPA Program Manager
National Guard Bureau
ATTN: 122 FW EA
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

Project: Indiana Air National Guard 122nd Fighter Wing Environmental Assessment
Location: Fort Wayne Air National Guard Base, Fort Wayne, Indiana

Dear Ms. Olson:

This responds to your letter dated June 1, 2021 and received electronically on June 21, 2021, requesting our comments on the aforementioned project.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (l6 U.S.C. 661 et. seq.) and are consistent with the intent of the National Environmental Policy Act of l969, the Endangered Species Act of l973, and the U. S. Fish and Wildlife Service's Mitigation Policy.

The National Guard Bureau is preparing an Environmental Assessment (EA) to evaluate the Fort Wayne, Indiana, Air National Guard's proposed mission conversion from A-10 close air support aircraft to F-16 multi-role fighter aircraft. This conversion will include various construction, demolition, and renovation projects at the Fort Wayne Air National Guard Base (ANGB), which is located at the Fort Wayne International Airport (FWIA). Various Special Use Airspace (SUA) currently utilized by the A-10 aircraft within Indiana, Illinois, and Ohio will continue to be used by the F-16 aircraft, with some time-of-use and type-of-use modifications.

The ANGB is located along the east side of the commercial airport and utilizes the same runways. The only work proposed on the runways is the installation of an F-16 Aircraft Arresting System near the ends of Runway 5/23, the main runway at 12,000 feet in length. The other modifications will take place within the physical Base, which includes buildings, aircraft parking apron, and other facilities. The modifications are proposed over a 10 year period. No physical modifications are proposed at the SUA.

FWIA and ANGB began in 1941 as Baer Field, an Army Air Base that was utilized for various Army Air Corps purposes during World War II. After the war, most of Baer Field was transferred to the City of Fort Wayne, with the ANGB being retained by the Federal Government for use by the National Guard. As the civilian airport grew, the runway configuration was modified and the main and crosswind runways were both lengthened; air cargo facilities were also constructed. Therefore, the International Airport and ANGB are the typical mixture of buildings, parking lots, runways and taxiways, lawns and grassed areas, landscaping, and shade trees, with clear zones at the ends of the runways (FAA FAR Part 77 obstacle clear surfaces). Beyond the land uses associated directly with the airport, nearby areas are primarily cropland, with scattered small woodlots.

The only significant wildlife we have been aware of in the vicinity of the airport are nesting grassland birds in habitats along Smith Road, on the west side between the 2 runways. These include savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow (*Ammodramus savannarum*), dickcissel (*Spiza americana*), horned lark (*Eremophila alpestris*), eastern meadowlark (*Sturnella magna*), and the Indiana endangered and U.S. Fish and Wildlife Service (FWS) species of conservation concern upland sandpiper (*Bartramia longicauda*). We do not have any information on the current status of these species at the FWIA/ANGB, but information may be available on the *eBIRD* Website (https://ebird.org/home) and/or the Indiana Bird List (in-bird-l@list.indiana.edu).

Your letter indicates that 2 bird species were listed on the Information for Planning and Conservation (IPaC) letter you received for this project, but it did not name those species. Therefore, we cannot comment at this time on those species if they are different from those discussed above.

We are not aware of any conflicts between these breeding birds at FWIA/ANGB and aircraft operations. However, bird species that are known to congregate in large flocks at various times of the year, such as European starling (*Sturnus vulgaris*), red-winged blackbird (*Agelaius pheoniceus*), common grackle (*Quiscalus quiscula*), and brown-headed cowbird (*Molothrus ater*), may present some problems. These species are attracted to waste grain in crop fields, which are not present on the airport but are the main land use surrounding it. If any actions are necessary at the FWIA/ANGB to address these types of bird strike issues with the F-16 conversion, they should be reviewed by the EA

In addition to evaluating the impacts of birds on ANGB operations, the EA should also address impacts of aircraft operations on birds. Because birds communicate vocally, loud noises can affect this communication. Loud noises also cause stress, leading birds to flush and leave their nest, which exposes the eggs/young to predation. There can also be physical damage to birds' ears due to loud noises, they can avoid/abandon noisy habitats, and noise can interfere with birds' ability to hear predators and other important sounds (Ortega, Catherine P. 2012. *Effects of noise pollution on birds: A brief review of our knowledge*. Ornithological Monographs 74: 6-22).

Most studies of impacts of noise on birds have been related to highway traffic and/or overall urban anthropogenic sounds, but there also have been some studies of aircraft noise. Studies at a major German airport that operates only between 0600 and 2300 daily, found that birds in an

adjacent forest started singing earlier in the morning than those of the same species in a similar forest a few miles away (Dominoni, Davide A., Stefan Grief, Erwin Nemeth, and Henrik Brumm. 2016. *Airport noise predicts song timing of European birds*. Ecology and Evolution 6 (17):6151-6159). The researchers believe this is in anticipation of the upcoming aircraft noise that birds have learned to expect throughout the day, so they begin their vocal communications before the aircraft operations begin. Song rate is important for birds for both male-male competition and attraction of a mate, so a reduction in singing time or reduced ability for songs to be heard can affect territorial behavior and reproductive success. Studies at 4 Spanish airports operating 24 hours a day reached the same conclusions with different species of birds and types of adjacent habitats (Gil, Diego, Mariam Honarmand, Javier Pascual, Eneider Perez-Mena, and Constantino Macias Garcia. 2015. *Birds living near airports advance their dawn chorus and reduce overlap with aircraft noise.* Behavioral Ecology 26(2):435-443).

Traffic noise from major highways and major airports is often constant/chronic, although it may be less at night if traffic is lighter, but aircraft noise to be addressed by this EA will be intermittent, being associated with takeoffs and landings of F-16s at FWIA/ANGB and training maneuvers at the SUA. We do not know how many or what type of aircraft currently utilize FWIA daily or what percentage involves the 122nd Fighter Wing, but the Proposed Action would replace 21 A-10 aircraft with 24 F-16s, while increasing operations from 4,023 annually to 4,400. We understand that F-16s are louder than A-10s but that their training requirements are different, with more air to air requirements and less air to ground maneuvers. Therefore, the noise at FWIA is likely to increase but the noise close to the ground at the SUA may be reduced. Much of the SUA in Indiana, Illinois, and Ohio are relatively remote from major highways and airports, so they are less likely to be subject to chronic loud noises. The sudden appearance of military jet aircraft at lower altitudes can affect birds differently than the constant noise at an airport. Fright-flight responses are likely, with reactions to noise depending upon the type of noise produced, including frequency, loudness, and duration.

Military-jet-specific studies of bird responses to low-level flights have been conducted in Canada, with the harlequin duck and osprey as the subjects. The studies were conducted with aircraft in a designated low-level training area in Labrador and not with simulated jet noise, so the observers were able to view the physical reactions of the birds to both the noise and the sudden presence of the aircraft (Goudie, R. Ian and Ian L. Jones. 2004. *Dose-response relationships of harlequin duck behaviour to noise from low-level military jet over-flights in central Labrador*. Environmental Conservation. 31(4):289-298; Goudie, R. Ian. 2006. *Multi-variate behavioural response of harlequin ducks to aircraft disturbance in Labrador.* Environmental Conservation. 33(1):28-35; Trimper, Perry G., Neil M. Standen, Leonard M. Lye, David Lemon, Tony E. Chubbs, and Gary W. Humphries. 1998. *Effects of low-level jet aircraft noise on the behaviour of nesting Osprey*. Journal of Applied Ecology. 35(1):122-130).

In the harlequin duck studies, military jets flew directly over breeding ducks at 100 to 500 feet above the lake; the jets appeared suddenly and with great noise (80 to >100 dBA), and departed equally suddenly. The duck's reactions varied from alert/agitation behaviors to flushing and panic diving, depending upon the altitude and noise of the aircraft. Even though the jets were gone rapidly and did not return, the birds displayed behavioral changes such as decreased courtship behavior and/or increased aggression toward fellow ducks that lasted up to 2 hours

after the appearance of the aircraft. However, critical behaviors such as feeding and preening/resting did not appear to be affected. The researchers believe that "the presence of residual effects on behaviour implied whole-body stress responses that were potentially more serious; these require further study because they are potentially more detrimental than immediate responses, and may not be detected in studies that focus on readily observed overt responses" (Goudie and Jones 2004). Further, they determined that the threshold of response to jet aircraft noise is approximately 80 dBA, and that harlequin ducks respond more strongly to the sudden appearance of loud, rapidly-moving jets than to slower and quieter floatplanes, helicopters, and military cargo planes (Goudie 2006).

For the osprey study, military jets were flown past 5 active nests several miles apart along a river at flight paths 0.75, 1.25, and 2.5 nautical miles from/parallel to the nests/river. The aircraft made 30 flights at several elevations from 100 to 500 feet above ground level during different passes over 5 observational periods in June, July, and August 1995, when incubation and hatching were occurring at the osprey nests. The osprey's reactions varied from alertness, to focusing on the oncoming jet even before the human observers heard it, to adjustments in incubation posture, but there was no visible startle-effect and no departure from the nest. The passes at 0.75 nm at 100 feet were the loudest, with a median of 89 dBA. The researchers believe that the hilly forested landscape and natural sounds from the river's rapids likely masked the jet noise except for the closest and lowest passes. The osprey reacted more strongly to the observers at the blinds, to other raptors, and to helicopters and float planes at any distance than they did to the jets (Trimper *et al*. 1998).

In the United States, there has been more research about bird-airplane strikes than about the impacts of aircraft noise on wildlife. However, a study in North Carolina utilizing black ducks and wood ducks tested whether or not the birds became habituated to the noise of military jets (Conomy, John T., James A. Dubovsky, James A. Collazo, and W. James Fleming. 1998. *Do black ducks and wood ducks habituate to aircraft disturbance?* Journal of Wildlife Management 62:1135-1142). The first part of the study placed captive-reared black ducks within an enclosure in a military jet training area wetland, with observations during low-level flights. Within about 2 weeks, the birds' responses (alert or attempt to flee) dropped from 39 percent of the flights to 6 percent, after which they remained just under 6 percent for the rest of the approximate 3 month study. In the second part of the study, simulated jet noise experiments were conducted at an otherwise non-flyover site utilizing both black ducks and wood ducks. The black ducks followed the same reactions and habituation as the on-site black ducks, but the wood ducks did not and did not become habituated. Therefore, studies would need to be conducted on a variety of different species (passerines, waterfowl, waterbirds, shorebirds, raptors) to learn their reactions to sudden military jet overflights.

The SUA in Ohio covers a very large area basically centered on the lower Scioto River, just north of the Ohio River at Portsmouth. It extends from Brown County on the west to Gallia, Meigs, and Athens Counties on the east within the Buckeye and Charlie Air Traffic Control Assigned Airspaces (ATCAA), a length of about 100 miles; the greatest north-south width is about 50 miles. A portion of the Wayne National Forest, plus numerous state forests, wildlife areas, and parks are included within the SUA. The Buckeye and Brush Creek Memorandum of Agreement

(MOA) areas are included within the Buckeye ATCAA; these are areas covered by an MOA among various Federal and/or State agencies addressing how the sites will be used by the Air National Guard, including how many flights are allowed annually (sorties), and the responsibilities of the various parties.

The Red Hills ATCAA is located in parts of 5 counties in southeastern Illinois and 2 counties in southwestern Indiana. It extends about 60 miles east-west and 30 miles north-south and consists primarily of agricultural lands, plus the Wabash River and a number of smaller river floodplains, the City of Vincennes in Indiana, and smaller cities in Illinois. The entire area is within the Red Hills MOA.

The Hill Top ATCAA is located about 60 miles west of the Fort Wayne ANGB, west of Peru and extending south to Lebanon in west-central Indiana. The ATCAA is a trapezoid about 50 miles wide on the north and 15 miles wide on the south, extending about 70 miles from north to south; all or parts of 9 counties are included. Most of the land is in agricultural use, but the Wabash River, Tippecanoe River, Wildcat Creek, and other significant streams and their wooded riparian habitats are included; the small Cass County portion of Grissom Air Reserve Base is included. The ATCAA includes the Twelve Mile MOA Complex and the Hill Top MOA.

The 2 smaller SUA in southeastern Indiana are located within a few miles of each other between Indianapolis and the Ohio River. The Racer ATCAA and MOA Complex are located in Bartholomew, Brown, and Jackson Counties adjacent to Camp Atterbury Army Training Center, and include parts of Hoosier National Forest and Brown County State Park. The Jefferson Proving Ground (JPG) ATCAA and MOA Complex and Ripley ATCAA are adjacent to each other within about 15 miles south-southeast of the Racer SUA. They include Big Oaks National Wildlife Refuge, the southern portion of Muscatatuck National Wildlife Refuge, state forests and state recreation areas. Big Oaks NWR encompasses most of the old JPG, surrounding the Air National Guard Range, but much of the property is closed to public use due to unexploded ordinance (UXO) and other hazardous materials.

As previously mentioned, the MOAs address the responsibilities of the various Federal and State parties to the agreements and the number of ANG sorties allowed at each SUA. The FWS is a party to the JPG MOA because of the presence the National Wildlife Refuges. The FWS accepts any flights and uses within the limits of the MOA. Any changes to this or the other MOAs due to the proposed increase in annual operations from 4,032 to 4,400 and/or the conversion to F-16s will need to be addressed in the EA and with the parties to the MOAs.

ENDANGERED SPECIES

The proposed project at the ANGB is within the range of the Federally endangered Indiana bat (Myotis sodalis) and the threatened northern long-eared bat (Myotis septentrionalis). The SUA are also within the range of these 2 species, along with a number of other species, primarily mussels. If there will be any changes at the SUA that could affect listed species, those changes and their impacts will need to be addressed in the EA and under Section 7 consultation.

On behalf of the Indiana Air National Guard, Stantec Consulting Services, Inc. was authorized to conduct a ground-based acoustic survey for bats at the Fort Wayne ANGB in June 2021. As of the date of this letter, the FWS has not been provided a report on the results of that survey. Therefore, at this time we cannot address the presence or absence of listed bats at the ANGB.

These endangered species comments constitute informal consultation only. They do not fulfill the requirements of Section 7 of the Endangered Species Act of 1973, as amended.

We appreciate the opportunity to provide scoping comments on this proposed EA. For further discussion, please contact Elizabeth McCloskey at elizabeth_mccloskey@fws.gov.

Sincerely yours,

/s/ *Elizabeth S. McCloskey*

for Scott E. Pruitt
Supervisor

Sent via email July 15, 2021; no hard copy to follow.

cc: Christie Stanifer, Environmental Coordinator, Division of Fish and Wildlife, Indianapolis, IN
Joseph Robb, Project Leader, Big Oaks and Muscatatuck NWR Complex, Madison, IN

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Indiana Ecological Services Field Office
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

In Reply Refer To: September 02, 2021
Consultation Code: 03E12000-2021-SLI-0683
Event Code: 03E12000-2021-E-09115
Project Name: Ft Wayne ANG Conversion EA

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project "may affect" listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all **wind energy projects** and **projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act *(*16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Indiana Ecological Services Field Office
620 South Walker Street
Bloomington, IN 47403-2121
(812) 334-4261

Project Summary

Consultation Code: 03E12000-2021-SLI-0683
Event Code: Some(03E12000-2021-E-09115)
Project Name: Ft Wayne ANG Conversion EA
Project Type:
Project Description: EA to assess impacts to Ft Wayne ANG Base due to conversion from A10 to F16
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.98387765,-85.17692279566643,14z

Counties: Allen County, Indiana

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ Incidental take of the NLEB is not prohibited here. Federal agencies may consult using the 4(d) rule streamlined process. Transportation projects may consult using the programmatic process. See www.fws.gov/midwest/endangered/mammals/nleb/index.html Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

TRADITIONAL
COUNCIL

CHAIRMAN
Juan Garza Jr., Kisisika

SECRETARY
Freddie Hernandez Sr., Kisakodita

TREASURER
David Treviño, Wapikaoda

MEMBERS
Kendall Scott, Metaa
Daniel Gonzalez Sr., Pietanakaaka

KICKAPOO

TRADITIONAL TRIBE OF TEXAS

2212 Rosita Valley Rd.
Eagle Pass, Texas 78852

TRIBAL COUNCIL

June 22, 2021

Jennifer Harty
Cultural Resources Program Manager (A4)
ATTN: 122 FW EA
3501 Fechet Avenue
Joint Base Andrews, MD 20762-5157

RE: National Guard Bureau EA Proposed Aircraft Mission Conversion

Dear Ms. Harty:

We are in receipt of a letter from Colonel, IN ANG Commander 122d Fighter Wing, Michael D. Stohler, dated June 3, 2021, by which he advises the Kickapoo Traditional Tribe of Texas ("KTTT") of the above referenced proposed project. In his letter, Col. Stohler is also requesting comments from the Tribe with the purpose of identifying any areas of concern regarding said project.

With respect to this matter, we hereby advise you that the Kickapoo Traditional Tribe of Texas does not own land in or near the project area, nor would the proposed project affect any of our historic properties of cultural or religious significance that we are aware of. Therefore, please be advised that we have no questions or comments with regard to the proposed project. Nevertheless, the Tribe appreciates the opportunity it was granted to consult.

If you have any additional questions or concerns with regard to this matter, please do not hesitate to contact this office at (830) 421-5388.

Respectfully,

Jason C. Nelson
General Counsel

Pokégnek Bodéwadmik
POKAGON BAND OF POTAWATOMI
LANGUAGE & CULTURE

07/20/2021

Jennifer Harty
Cultural Resources Program Manager
NGB.A4.A4A.NEPA.COMMENTS.Org@us.af.mil

ATTN: 122 FW EA

Dear Responsible Party:

Migwetth for contacting me regarding this project. As THPO, I am responsible for handling Section 106 Consultations on behalf of the tribe. I am writing to inform you that I have reviewed the details for the project referenced above. The proposed work is occurring within a mile of a known historic site or feature that is recorded in the Pokagon Band Historic Inventory Database. I have made the determination that this undertaking will have **No Adverse Effect** on any historic, religious, or culturally significant resources to the Pokagon Band of Potawatomi Indians.

If any cultural or archaeological resources are uncovered during construction, please stop work and contact me immediately. Should you have any other questions, please don't hesitate to contact me at your earliest convenience.

Sincerely,

Matthew Bussler

Matthew J.N. Bussler
Tribal Historic Preservation Officer
Pokagon Band of Potawatomi Indians
Office: (269) 462-4316
Cell: (269) 519-0838
Matthew.Bussler@Pokagonband-nsn.gov

59291 Indian Lake Road • PO Box 180 • Dowagiac, MI 49047 • www.PokagonBand-nsn.gov
(269) 462-4325 • (800) 517-0777 toll free • (269) 783-2499 fax

OLSON, ALANA M GS-13 USAF ANG NGB/A4

From: Mayo, Toni <tmayo@indot.IN.gov>
Sent: Thursday, June 24, 2021 1:25 PM
To: OLSON, ALANA M GS-13 USAF ANG NGB/A4; NGB A4/A4A NEPA COMMENTS Org
Cc: Kaiser, Jason
Subject: [Non-DoD Source] Fort Wayne District Response to Scoping Letter for Ft Wayne ANG Base

Importance: High

Dear Ms. Olson,

On behalf of Mr. Todd H. Johnson, Fort Wayne District Deputy Commissioner, our team has reviewed the Air National Guard documents.
In response to your questions, this minor increase in employees will not generate enough traffic to affect any of our facilities.
Also, this project does not appear to be in or near the State's right of way.

We have also shared this information with Mr. Marty Blake, Manager of INDOT Office of Aviation. Next week, you will receive an aeronautical response from Mr. Blake's office concerning air space requirements for the construction aspect of the project since it is on the FWA airfield. Here is Mr. Blake's contact information (317) 407-7451 www.aviation.indot.in.gov in case you have other concerns that need to be addressed.

If the Fort Wayne District can be of further service, please let us know. My direct line is 260-969-8314.

Thank you for sharing this information with our team.

Sincerely,

Toni R. Mayo
INDOT Fort Wayne District
Communications Director/Customer Service Director she/her
INDOT Customer Service Toll Free Line 855-INDOT4U (463-6848)
tmayo@indot.in.gov

"In Indiana, the Crossroads of America is more than a motto: It's our mission."
-Governor Eric Holcomb

This sustainable, data driven plan dedicates more than $30 billion over the next 20 years to improving the conditions of existing roads and bridges- both state and local, finishing major projects, and building for the future.

From: NEinformation <NEinformation@indot.IN.gov>
Sent: Monday, June 21, 2021 4:28 PM

From: Dial, Marcus
To: OLSON, ALANA M GS-13 USAF ANG NGB/A4
Cc: Mayo, Toni; Blake, Martin
Subject: [Non-DoD Source] Scoping Response for Ft. Wayne ANG Base
Date: Monday, July 19, 2021 9:35:15 AM

Alana,

Thanks for reaching out and giving us the opportunity to respond to this scoping letter for the Ft. Wayne ANG Base. After review, we would like to provide the following comments.

1. Any new construction or alteration for on-airport facilities will require a state tall structure permit
2. The FAA airspace study determination becomes your tall structure permit provided our office as well as the Ft. Wayne Int'l Airport are notified properly
3. Any temporary equipment supporting the construction and structural improvements would most likely need to be studied as well for airspace concerns

Please feel free to reach out to our office with any other questions or concerns regarding the tall structure process.

Thanks,

Marcus Dial
Aviation Planner/Office of Aviation
Indiana Department of Transportation
(317)407-9511 - office
mdial@indot.in.gov
www.aviation.indot.in.gov

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

JB Pritzker, Governor
Colleen Callahan, Director

July 1st, 2021

Ms. Alana M. Olson
NEPA Program Manager
National Guard Bureau (NGB/A4AM)
3501 Fetchet Avenue
Joint Base Andrews, MD 20762

RE: NEPA Scoping Proposed Aircraft Conversion from A-10 to F-16, 122nd Fighter Wing, Indiana Air National Guard

Dear Ms. Olson:

The Illinois Department of Natural Resources (Department) has reviewed the above-mentioned project as part of the National Environmental Policy Act (NEPA) scoping process. The project involves a proposed aircraft mission conversion from A-10 aircraft to F-16 aircraft for the Indiana Air national Guard, 122nd Fighter Wing, located at Fort Wayne Air National Guard Base in Fort Wayne, Indiana.

The Department understands that a portion of the Red Hills Military Operations Area (MOA) generally includes the following Illinois counties: Clay, Crawford, Edwards, Effingham, Jasper, Lawrence, Richland, Wabash, and Wayne. The Department has determined that adverse impacts to state protected natural resources, including fish and wildlife, are unlikely given "low altitude flights" over natural habitats, such as forested areas, are minimized to the extent practical. The Department invites you to submit an "information request" in our EcoCAT tool at the following link if you would like a list of state protected natural resources known in the MOA to aid in development of your Environmental Assessment (EA): https://dnr2.illinois.gov/EcoPublic/. If desired, more detailed location data of state protected natural resources can be obtained from our Natural Heritage Database upon request to Tara Kieninger (Tara.Kieninger@Illinois.gov) with an executed data use agreement.

Thank you for the opportunity to comment. Please contact Mr. Brian Willard of this office at 217-782-0031 or brian.c.willard@illinois.gov for additional information, or if providing a response to this correspondence.

Sincerely,

Nathan Grider,
Manager, Impact Assessment Section
One Natural Resources Way
Springfield, IL 62702-1271
nathan.grider@illinois.gov
Phone: (217) 557-0480

CC: IDNR - ORC

Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR MARY MERTZ, DIRECTOR

Kendra S. Wecker, Chief
Division of Wildlife
2045 Morse Rd, Building G
Columbus, Ohio 43229
Phone: (614) 265-6300

June 23, 2021

Alana M. Olson
NEPA Program Manager
National Guard Bureau (NGB/A4AM)
3501 Fetchet Avenue
Joint Base Andrews MD 20762

RE: Scoping Letter for Ft Wayne ANG Base

Dear Ms. Olson:

The Ohio Division of Wildlife (DOW) appreciates the opportunity to review and comment on the proposed aircraft mission conversion from A-10 aircraft to F-16 aircraft for the Indiana Air National Guard (ANG) 122nd Fighter Wing (122 FW), located at Fort Wayne Air National Guard Base (ANGB), Fort Wayne, Indiana. The DOW has reviewed and determined that the proposed activities will not impact wildlife resources within Ohio. Therefore, the DOW has no concerns and/or comments.

If you have any questions, please contact Nathan Reardon, DOW Compliance Coordinator at 614-265-6741 or Nathan.reardon@dnr.state.oh.us.

Sincerely,

Kendra S. Wecker
Chief

Other IICEP Responses Received

Agency / Name / Title	Date Received	Comment
Miami County, IN / Alan Hunt / Chairman, Board of County Commissioners	22 June 2021	No concerns.
Scott County, IN / Mike Jones / President, Board of County Commissioners	22 June 2021	Letter received and no concerns.
Pulaski County, IN / Charles Mellon / President, Board of County Commissioners	03 July 2021	Letter received.

Mitchell E. Daniels, Jr., Governor
Robert E. Carter, Jr., Director

DNR Indiana Department of Natural Resources

Division of Historic Preservation & Archaeology • 402 W. Washington Street, W274 · Indianapolis, IN 46204-2739
Phone 317-232-1646 • Fax 317-232-0693 · dhpa@dnr.IN.gov

December 3, 2009

Terry Rudolph
TEC Inc.
250 Bobwhite Court, Suite 200
Boise, Idaho 83706

Federal Agency: National Guard Bureau

Re: Final Cultural resources survey and evaluation (11/09) report concerning the 122nd Fighter Wing Air National Guard Station at Fort Wayne International Airport (DHPA #5711)

Dear Ms. Rudolph:

Pursuant to Section 110 of the National Historic Preservation Act (16 U.S.C. § 470h-2), the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has conducted an analysis of the materials dated November 3, 2009 and received on November 4, 2009 for the above indicated resources in Fort Wayne, Allen County, Indiana.

Thank you for your recent submission. We have reviewed the Draft Final Cultural Resources Survey Report prepared by TEC Corporation and agree with the methodology presented there, specifically that the resources at the 122nd Fighter Wing should be evaluated using the National Register of Historic Places Criteria for Evaluation and in the context of the Cold War era.

Based on the documentation, we agree with TEC Corporation's assessment that the 18 surveyed structures do not appear to be individually eligible for inclusion in the National Register of Historic Places. We also agree that the resources do not exhibit exceptional significance under Criterion Consideration G for resources less than fifty years old. Furthermore, we do not believe that the resources at the 122 Fighter Wing could be considered nationally significant as defined by the Department of Defense Cold War-era contexts referenced in the report.

In terms of archaeology, we concur with the archaeological report that no currently known archaeological resources eligible for inclusion in the National Register of Historic Places have been recorded within the proposed project area. No further archaeological investigations appear necessary.

A copy of the revised 36 C.F.R. Part 800 that went into effect on August 5, 2004 may be found on the Internet at www.achp.gov for your reference. If you have questions about archaeological issues please contact Cathy Draeger-Williams at (317) 234-3791 or cdraeger-williams@dnr.IN.gov. If you have questions about buildings or structures please contact Chad Slider at (317) 234-5366 or cslider@dnr.IN.gov. Additionally, in all future correspondence regarding the above indicated project, please refer to DHPA #5711.

Very truly yours,

James A. Glass, Ph.D.
Deputy State Historic Preservation Officer

JAG:CWS:CDW:cdw

emc: Karstin Carmany-George, Indiana Army National Guard

APPENDIX C
PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL ASSESSMENT

Note: This is a placeholder appendix for the distribution letters, newspaper notices/affidavits, and response letters received during public review of the Draft Environmental Assessment.

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APPENDIX D AIRSPACE OPERATIONS

Table D-1 Current and Proposed Airspace Operations at Twelve Mile/Hill Top MOAs

Aircraft Type	Baseline Sorties per Year			Proposed Sorties per Year			Time spent in airspace per sortie (minutes)	
	Day (0700–2200)	Night (2200–0700)	Total	Day (0700–2200)	Night (2200–0700)	Total	Baseline	Proposed
A-10	836	7	**843**	0	0	**0**	60	0
F-16	0	0	**0**	370	0	**370**	0	50
F-16	0	0	**0**	475	5	**480**	0	45
KC-135R	33	7	**40**	33	7	**40**	90	90
Total	**869**	**14**	**883**	**878**	**12**	**890**	—	—

Key: MOA = Military Operations Area.

Table D-2 Current and Proposed Airspace Operations at Jefferson Proving Ground MOAs/R-3403

Aircraft Type	Baseline Sorties per Year			Proposed Sorties per Year			Time spent in airspace per sortie (minutes)	
	Day (0700–2200)	Night (2200–0700)	Total	Day (0700–2200)	Night (2200–0700)	Total	Baseline	Proposed
A-10	536	5	**541**	0	0	**0**	40	0
F-16	0	0	**0**	140	0	**140**	0	45
F-16	0	0	**0**	49	1	**50**	0	30
C-130	151	0	**151**	151	0	**151**	60	60
CH-53	2	1	**3**	2	1	**3**	90	90
Total	**762**	**10**	**772**	**415**	**6**	**421**	—	—

Key: MOA = Military Operations Area; R- = Restricted.

Table D-3 Current and Proposed Airspace Operations at Racer MOAs/R-3401

Aircraft Type	Baseline Sorties per Year			Proposed Sorties per Year			Time spent in airspace per sortie (minutes)	
	Day (0700–2200)	Night (2200–0700)	Total	Day (0700–2200)	Night (2200–0700)	Total	Baseline	Proposed
A-10	69	1	**70**	0	0	**0**	40	0
F-16	0	0	**0**	20	0	**20**	0	45
F-16	0	0	**0**	49	1	**50**	0	30
C-130	34	0	**34**	34	0	**34**	60	60
CH-53	9	2	**11**	9	2	**11**	90	90
Total	**183**	**7**	**190**	**183**	**7**	**190**	—	—

Key: MOA = Military Operations Area; R- = Restricted.

Table D-4 Current and Proposed Airspace Operations at Buckeye/Brush Creek MOAs

Aircraft Type	Baseline Sorties per Year			Proposed Sorties per Year			Time spent in airspace per sortie (minutes)	
	Day (0700–2200)	Night (2200–0700)	Total	Day (0700–2200)	Night (2200–0700)	Total	Baseline	Proposed
A-10	55	1	**56**	0	0	**0**	30	0
F-16	0	0	**0**	99	1	**100**	0	30
F-16	0	0	**0**	644	6	**650**	0	35
C-17	202	0	**202**	202	0	**202**	60	60
Total	**339**	**1**	**340**	**1,027**	**7**	**1,034**	—	—

Key: MOA = Military Operations Area.

Table D-5 Current and Proposed Airspace Operations at Red Hills MOA

Aircraft Type	Baseline Sorties per Year			Proposed Sorties per Year			Time spent in airspace per sortie (minutes)	
	Day (0700–2200)	Night (2200–0700)	Total	Day (0700–2200)	Night (2200–0700)	Total	Baseline	Proposed
A-10	11.88	0.12	**12**	0	0	**0**	40	0
A-10	3.96	0.04	**4**	0	0	**0**	30	0
Total	**15.84**	**0.16**	**16**	**0**	**0**	**0**	—	—

Key: MOA = Military Operations Area.

APPENDIX E
RECORD OF NON-APPLICABILITY (RONA) AND AIR CONFORMITY APPLICABILITY MODEL (ACAM) REPORTS

RECORD OF NON-APPLICABILITY (RONA)

July 26, 2021

This Record of Non-Applicability supports the National Guard Bureau's Environmental Assessment for the proposed F-16 mission conversion for the 122d Fighter Wing at Fort Wayne Air National Guard Base, Fort Wayne, Indiana. The Proposed Action includes the following:

- replacing the A-10 mission aircraft with one squadron of F-16 aircraft, which would increase annual operations from 4,032 with the A-10 to 4,400 with the F-16
- increasing personnel by 10 full-time and 90 reservists (one weekend per month)
- implementing 17 various construction, renovation, and demolition projects to satisfy mission requirements supporting the change from A-10 to F-16 aircraft

Several counties within the air quality study area—Allen, Jackson, and Johnson Counties, Indiana—are subject to maintenance requirements for the 1997 revoked ozone National Ambient Air Quality Standard; the study area is fully in attainment for all other criteria pollutants. Federal actions may be exempt from Conformity Determinations if they do not exceed designated *de minimis* levels for criteria pollutants as set forth in 40 CFR 93.153(c).

The Proposed Action falls under the Record of Non-Applicability category pursuant to 40 Code of Federal Regulations (CFR) Parts 52 and 93. General conformity under the Clean Air Act, Section 176 has been evaluated according to the requirements of 40 CFR 93, Subpart B. Total direct and indirect emissions for ozone precursors (volatile organic compounds and nitrogen oxides), as modeled using the Air Force's Air Conformity Applicability Model (ACAM), do not exceed the applicable thresholds of 100 tons per year as established in 40 CFR 93.153(b). A general conformity determination is therefore not required.

Supported documentation and emission estimates:

(X) Are Attached

( ) Appear in the NEPA Documentation

( ) Other (Not Necessary)

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 an analysis to assess the potential air quality impact/s associated with the action 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 General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: FORT WAYNE ANGB
State: Indiana
County(s): Allen; Decatur; Jackson; Jefferson; Jennings; Ripley; Scott; Washington; Cass; Fulton; Miami; Pulaski; White; Adams; Fayette; Highland; Pike; Ross; Scioto; Bartholomew; Brown; Johnson; Jasper
Regulatory Area(s): NOT IN A REGULATORY AREA; Fort Wayne, IN; Jackson Co, IN; Indianapolis, IN

b. Action Title: Environmental Assessment for F-16 Mission Conversion, 122d Fighter Wing, Fort Wayne ANGB, Fort Wayne, Indiana

c. Project Number/s (if applicable): ATQZ132118, -222000, -169004, -132045, -242753, -142406, -112254, -112264, -139764, -112265, -242304, -222005, -012345

d. Projected Action Start Date: 8 / 2021

e. Action Description:

NGB proposes the full replacement of the A 10 mission aircraft at Fort Wayne ANGB with one fighter squadron of 24 Primary Aircraft Authorization (PAA) of F 16 aircraft.

Annual aircraft operations would increase, beginning FY23.

100 additional personnel would be at Fort Wayne ANGB (90 for 2-day drill once a month, and 10 full-time)

17 construction, renovation, and demolition projects to support the F-16 aircraft and mission, between 2022 and 2031.

f. Point of Contact:

Name: Mary C Young
Title: NEPA Analyst
Organization: Marstel-Day
Email: myoung@marstel-day.com
Phone Number: 540-419-6163

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

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)

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

NOT IN A REGULATORY AREA			
VOC	0.000		
NOx	0.000		
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		
Fort Wayne, IN			
VOC	0.035	100	No
NOx	0.203	100	No
CO	0.257		
SOx	0.001		
PM 10	0.008		
PM 2.5	0.008		
Pb	0.000		
NH3	0.000		
CO2e	58.2		
Jackson Co, IN			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		
Indianapolis, IN			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

2022

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	0.084		
NOx	1.960		
CO	-0.114		
SOx	0.008		
PM 10	-0.089		
PM 2.5	-0.021		
Pb	0.000		
NH3	0.000		

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

CO2e	25.6		
Fort Wayne, IN			
VOC	-3.553	100	No
NOx	9.443	100	No
CO	-6.680		
SOx	0.575		
PM 10	13.647		
PM 2.5	0.392		
Pb	0.000		
NH3	0.001		
CO2e	2037.5		
Jackson Co, IN			
VOC	0.056	100	No
NOx	0.380	100	No
CO	-0.102		
SOx	-0.027		
PM 10	-0.115		
PM 2.5	-0.060		
Pb	0.000		
NH3	0.000		
CO2e	-82.5		
Indianapolis, IN			
VOC	0.011	100	No
NOx	0.137	100	No
CO	-0.006		
SOx	0.001		
PM 10	-0.006		
PM 2.5	-0.001		
Pb	0.000		
NH3	0.000		
CO2e	4.1		

2023

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-14.674	100	No
NOx	33.092	100	No
CO	-30.434		
SOx	2.289		
PM 10	-2.760		
PM 2.5	1.395		
Pb	0.000		

NH3	0.006		
CO2e	6953.9		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2024

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	0.458		
NOx	8.481		
CO	0.580		
SOx	0.036		
PM 10	-0.302		
PM 2.5	-0.062		
Pb	0.000		
NH3	0.001		
CO2e	327.4		
Fort Wayne, IN			
VOC	-15.366	100	No
NOx	30.444	100	No
CO	-34.056		
SOx	2.282		
PM 10	-2.890		
PM 2.5	1.273		
Pb	0.000		
NH3	0.004		
CO2e	6350.4		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		

Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.370		
NOx	8.007		
CO	-0.180		
SOx	0.035		
PM 10	-0.349		
PM 2.5	-0.079		
Pb	0.000		
NH3	0.000		
CO2e	165.9		
Fort Wayne, IN			
VOC	-15.017	100	No
NOx	32.289	100	No
CO	-31.209		
SOx	2.288		
PM 10	-2.727		
PM 2.5	1.335		
Pb	0.000		
NH3	0.006		
CO2e	6972.1		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		

PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-15.113	100	No
NOx	31.631	100	No
CO	-32.314		
SOx	2.286		
PM 10	-2.421		
PM 2.5	1.315		
Pb	0.000		
NH3	0.005		
CO2e	6798.0		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			

VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-15.048	100	No
NOx	31.332	100	No
CO	-32.631		
SOx	2.286		
PM 10	-2.830		
PM 2.5	1.307		
Pb	0.000		
NH3	0.005		
CO2e	6758.7		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2028

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		

Fort Wayne, IN			
VOC	-15.307	100	No
NOx	30.654	100	No
CO	-33.747		
SOx	2.283		
PM 10	-2.880		
PM 2.5	1.284		
Pb	0.000		
NH3	0.004		
CO2e	6511.9		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2029

Pollutant	**Action Emissions (ton/yr)**	**GENERAL CONFORMITY**	
		Threshold (ton/yr)	**Exceedance (Yes or No)**
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-15.367	100	No
NOx	30.502	100	No
CO	-34.023		
SOx	2.282		
PM 10	-2.884		
PM 2.5	1.279		
Pb	0.000		
NH3	0.004		

CO2e	6448.8		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2030

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-15.367	100	No
NOx	30.502	100	No
CO	-34.023		
SOx	2.282		
PM 10	-2.884		
PM 2.5	1.279		
Pb	0.000		
NH3	0.004		
CO2e	6448.8		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		

NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

2031

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-15.316	100	No
NOx	30.804	100	No
CO	-33.541		
SOx	2.283		
PM 10	-2.826		
PM 2.5	1.289		
Pb	0.000		
NH3	0.004		
CO2e	6538.5		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		

Pb	0.000		
NH3	0.000		
CO2e	16.4		

2032 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.337		
NOx	7.841		
CO	-0.458		
SOx	0.034		
PM 10	-0.355		
PM 2.5	-0.085		
Pb	0.000		
NH3	0.000		
CO2e	102.4		
Fort Wayne, IN			
VOC	-15.367	100	No
NOx	30.502	100	No
CO	-34.023		
SOx	2.282		
PM 10	-2.884		
PM 2.5	1.279		
Pb	0.000		
NH3	0.004		
CO2e	6448.8		
Jackson Co, IN			
VOC	0.224	100	No
NOx	1.520	100	No
CO	-0.409		
SOx	-0.109		
PM 10	-0.459		
PM 2.5	-0.239		
Pb	0.000		
NH3	0.000		
CO2e	-329.9		
Indianapolis, IN			
VOC	0.045	100	No
NOx	0.549	100	No
CO	-0.023		
SOx	0.005		
PM 10	-0.022		
PM 2.5	-0.004		
Pb	0.000		
NH3	0.000		
CO2e	16.4		

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

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Mary C. Young

Mary C Young, NEPA Analyst

July 26, 2021
DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: FORT WAYNE ANGB
State: Indiana
County(s): Allen; Decatur; Jackson; Jefferson; Jennings; Ripley; Scott; Washington; Cass; Fulton; Miami; Pulaski; White; Adams; Fayette; Highland; Pike; Ross; Scioto; Bartholomew; Brown; Johnson; Jasper
Regulatory Area(s): NOT IN A REGULATORY AREA; Fort Wayne, IN; Jackson Co, IN; Indianapolis, IN

- Action Title: Environmental Assessment for F-16 Mission Conversion, 122d Fighter Wing, Fort Wayne ANGB, Fort Wayne, Indiana

- Project Number/s (if applicable): ATQZ132118, -222000, -169004, -132045, -242753, -142406, -112254, -112264, -139764, -112265, -242304, -222005, -012345

- Projected Action Start Date: 8 / 2021

- Action Purpose and Need:

The purpose of the Proposed Action is to facilitate an aircraft conversion at the 122 FW from A 10 aircraft to F 16 aircraft. The action is needed to accommodate a 122 FW mission transition from an A-10 unit to an F-16 unit.

- Action Description:

NGB proposes the full replacement of the A 10 mission aircraft at Fort Wayne ANGB with one fighter squadron of 24 Primary Aircraft Authorization (PAA) of F 16 aircraft.

Annual aircraft operations would increase, beginning FY23.

100 additional personnel would be at Fort Wayne ANGB (90 for 2-day drill once a month, and 10 full-time)

17 construction, renovation, and demolition projects to support the F-16 aircraft and mission, between 2022 and 2031.

- Point of Contact

Name: Mary C Young
Title: NEPA Analyst
Organization: Marstel-Day
Email: myoung@marstel-day.com
Phone Number: 540-419-6163

- Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	#3: Munitions Maintenance (MX)/Storage Complex/ ATQZ169004
3.	Personnel	Additional Personnel
4.	Construction / Demolition	#1: CZ Secure Office Space / ATQZ132118
5.	Construction / Demolition	#2: Install F 16 Aircraft Arresting System / ATQZ222000
6.	Construction / Demolition	#4: Repair Aircraft Parking Apron / ATQZ132045
7.	Construction / Demolition	#5: Repair Squadron Operations Facility / ATQZ242753
8.	Construction / Demolition	#8: Renovate Hangar and Repair Fire Suppression / ATQZ112264
9.	Construction / Demolition	#10: Addition to Weapons Release Facility / ATQZ139764
10.	Construction / Demolition	#11: Mission Training Center / ATQZ259786
11.	Construction / Demolition	#15: Construct Fitness Center / ATQZ242304
12.	Construction / Demolition	#17: Demolish Building 758 / ATQZ012345
13.	Construction / Demolition	#9: Hydrazine Storage Facility / ATQZ252123
14.	Aircraft	A-10 Operations at Fort Wayne ANGB local airfield (REMOVE)

15.	Aircraft	F-16 Operations at Fort Wayne ANGB local airfield ADD
16.	Aircraft	F-16 Operations in JPG MOAs/R-3403 under 3,000 feet ADD
17.	Aircraft	A-10 Operations in JPG MOAs/R-3403 under 3,000 feet REMOVE
18.	Heating	#10 Addition to Weapons Release Facility
19.	Heating	#15 Construct Fitness Center
20.	Heating	#03 Munitions MX and Storage Climate Control
21.	Heating	#11 Mission Training Center
22.	Aircraft	F-16 Operations in Twelve Mile MOAs under 3,000 feet ADD
23.	Aircraft	F-16 Operations in Brush Creek MOA under 3,000 feet ADD
24.	Aircraft	F-16 Operations in Racer MOAs/R-3401 under 3,000 feet ADD
25.	Aircraft	A-10 Operations in Twelve Mile MOAs under 3,000 feet REMOVE
26.	Aircraft	A-10 Operations in Racer MOAs/R-3401 under 3,000 feet REMOVE
27.	Aircraft	A-10 Operations in Brush Creek MOA under 3,000 feet REMOVE

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: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #3: Munitions Maintenance (MX)/Storage Complex/ ATQZ169004

- Activity Description:
Construct above ground storage (6,140 SF)
Construction munitions M&I and inert storage (9,900 SF)
Construct storage igloos (2,400 SF)
Construction munitions assembly complex pad (840 SY)
Demolish B. 790 (5,000 SF)

- Activity Start Date
Start Month: 4
Start Month: 2022

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.676992
SO_x	0.007702
NO_x	2.735848
CO	3.222467
PM 10	14.405319

Pollutant	Total Emissions (TONs)
PM 2.5	0.109113
Pb	0.000000
NH_3	0.001858
CO_2e	753.1

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2022

- Phase Duration
Number of Month: 3
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 5000
Height of Building to be demolished (ft): 15

- 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 Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0410	0.0006	0.2961	0.3743	0.0148	0.0148	0.0037	58.556
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

2.2 Site Grading Phase

2.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 2
Start Year: 2022

- Phase Duration

Number of Month: 6
Number of Days: 0

2.2.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 239250
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- 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	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	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

2.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

2.2.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 3
Start Year: 2022

- Phase Duration
Number of Month: 18
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 18440
Height of Building (ft): 15
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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0797	0.0013	0.5505	0.3821	0.0203	0.0203	0.0071	128.81
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0274	0.0006	0.1265	0.2146	0.0043	0.0043	0.0024	54.457
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295

LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 3
Start Year: 2023

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

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 18440
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

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624

HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

2.4.4 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

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 3
Start Year: 2023

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

2.5.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 7560

- 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

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0806	0.0014	0.4657	0.5731	0.0217	0.0217	0.0072	132.92
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0507	0.0012	0.2785	0.3488	0.0105	0.0105	0.0045	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1919	0.0024	1.3611	0.7352	0.0536	0.0536	0.0173	239.51
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0383	0.0007	0.2301	0.3598	0.0095	0.0095	0.0034	66.884

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

$VOC_P = (2.62 * PA) / 43560$

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)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: Additional Personnel

- Activity Description:
Alternative A would result in an increase of 100 personnel at Fort Wayne ANGB to achieve the manpower requirements of the F 16 fighter mission. Approximately 90 percent of these personnel would be on the installation for the unit two-day training drill that is typically conducted once per month. Therefore, about 10 additional personnel would be employed full-time, and 90 additional personnel would be on the installation one weekend per month. Like existing personnel at Fort Wayne ANGB, the new personnel would live in the community, across the region.

- Activity Start Date
Start Month: 1
Start Year: 2023

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.059354
SO_x	0.000401
NO_x	0.051840
CO	0.677246
PM 10	0.001459

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.001301
Pb	0.000000
NH_3	0.003683
CO_2e	58.8

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 0
Civilian Personnel: 10
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 90

- Default Settings Used: Yes

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

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)

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

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

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

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

3.5 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

4. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

4.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #1: CZ Secure Office Space / ATQZ132118

- Activity Description:
Renovate 333 SF of Building 780

- Activity Start Date
Start Month: 8
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.035480
SO_x	0.000604
NO_x	0.203087
CO	0.257414
PM 10	0.008140

Pollutant	Total Emissions (TONs)
PM 2.5	0.008131
Pb	0.000000
NH_3	0.000171
CO_2e	58.2

4.1 Building Construction Phase

4.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 3
Start Year: 2021

- Phase Duration
Number of Month: 3
Number of Days: 0

4.1.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 333
Height of Building (ft): 15
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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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

4.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

4.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #2: Install F 16 Aircraft Arresting System / ATQZ222000

- Activity Description:
Install primary and secondary arresting systems.
Install pits, textile foundations, access pavements, site work; alter runway lighting; demolish foundations, pavement, lighting.

- Activity Start Date
Start Month: 4
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.120374
SO_x	0.001593
NO_x	0.683053
CO	0.921078
PM 10	0.039133

Pollutant	Total Emissions (TONs)
PM 2.5	0.033959
Pb	0.000000
NH_3	0.000632
CO_2e	155.5

5.1 Demolition Phase

5.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2023

- Phase Duration
Number of Month: 3
Number of Days: 0

5.1.2 Demolition Phase Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- General Demolition Information
Area of Building to be demolished (ft^2): 48960
Height of Building to be demolished (ft): 0.5

- 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

5.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0382	0.0006	0.2766	0.3728	0.0127	0.0127	0.0034	58.549
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

5.1.4 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
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

5.2 Paving Phase

5.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 2
Start Year: 2023

- Phase Duration
Number of Month: 4
Number of Days: 0

5.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 25920

- 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	1	8
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

5.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.596	000.007	000.643	005.527	000.015	000.013		000.034	00374.798
LDGT	000.795	000.010	001.103	008.545	000.016	000.014		000.034	00499.143
HDGV	001.380	000.015	002.988	027.003	000.037	000.033		000.046	00770.644
LDDV	000.258	000.003	000.313	003.448	000.006	000.006		000.008	00380.537
LDDT	000.569	000.005	000.838	007.038	000.008	000.008		000.008	00592.064
HDDV	000.829	000.014	008.692	002.818	000.381	000.350		000.029	01564.723
MC	002.517	000.008	000.787	015.084	000.028	000.024		000.049	00396.131

5.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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
$VOC_P = (2.62 * PA) / 43560$

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)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #4: Repair Aircraft Parking Apron / ATQZ132045

- Activity Description:
Upgrade and repair parking apron. Install grounding and tie-down points, repair pavement surface, repair trim pad, restripe pavement markings.

- Activity Start Date
Start Month: 4
Start Month: 2023

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.215949
SO_x	0.002847
NO_x	1.225833
CO	1.646248
PM 10	0.064404

Pollutant	Total Emissions (TONs)
PM 2.5	0.061192
Pb	0.000000
NH_3	0.001125
CO_2e	278.9

6.1 Demolition Phase

6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2023

- Phase Duration

Number of Month: 6
Number of Days: 0

6.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 30000
Height of Building to be demolished (ft): 0.5

- 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

6.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0382	0.0006	0.2766	0.3728	0.0127	0.0127	0.0034	58.549
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1830	0.0024	1.2623	0.7077	0.0494	0.0494	0.0165	239.49
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0364	0.0007	0.2127	0.3593	0.0080	0.0080	0.0032	66.879

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352

LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

6.1.4 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
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

6.2 Paving Phase

6.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2023

- Phase Duration
Number of Month: 6
Number of Days: 0

6.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 90000

- 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 Emission Factors (lb/hour) (default)

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.596	000.007	000.643	005.527	000.015	000.013		000.034	00374.798
LDGT	000.795	000.010	001.103	008.545	000.016	000.014		000.034	00499.143
HDGV	001.380	000.015	002.988	027.003	000.037	000.033		000.046	00770.644
LDDV	000.258	000.003	000.313	003.448	000.006	000.006		000.008	00380.537
LDDT	000.569	000.005	000.838	007.038	000.008	000.008		000.008	00592.064
HDDV	000.829	000.014	008.692	002.818	000.381	000.350		000.029	01564.723
MC	002.517	000.008	000.787	015.084	000.028	000.024		000.049	00396.131

6.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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
$VOC_P = (2.62 * PA) / 43560$

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)

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

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

- Activity Title: #5: Repair Squadron Operations Facility / ATQZ242753

- Activity Description:
Renovate Building 753

- Activity Start Date
Start Month: 1
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.153993
SO_x	0.002977
NO_x	0.806203
CO	1.314982
PM 10	0.058020

Pollutant	Total Emissions (TONs)
PM 2.5	0.027701
Pb	0.000000
NH_3	0.000929
CO_2e	288.5

7.1 Demolition Phase

7.1.1 Demolition Phase Timeline Assumptions

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

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Start Year: 2024

- Phase Duration
Number of Month: 3
Number of Days: 0

7.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 12000
Height of Building to be demolished (ft): 12

- 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

7.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0357	0.0006	0.2608	0.3715	0.0109	0.0109	0.0032	58.544
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295

LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

7.1.4 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
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

7.2 Building Construction Phase

7.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2024

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

7.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 6120
Height of Building (ft): 15
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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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

7.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0715	0.0013	0.4600	0.3758	0.0161	0.0161	0.0064	128.78
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0246	0.0006	0.0973	0.2146	0.0029	0.0029	0.0022	54.451
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

7.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #8: Renovate Hangar and Repair Fire Suppression / ATQZ112264

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Description:

Replace HEF and wet sprinkler piping.
Composite shop, environmental management, egress shop, R & R shop, and adjacent spaces will require reconfiguring due to the mission conversion.

- Activity Start Date

Start Month: 1
Start Month: 2025

- Activity End Date

Indefinite: False
End Month: 4
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.281055
SO_x	0.005189
NO_x	1.625055
CO	2.381567
PM 10	0.148893

Pollutant	Total Emissions (TONs)
PM 2.5	0.055284
Pb	0.000000
NH_3	0.002124
CO_2e	504.0

8.1 Demolition Phase

8.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 3
Number of Days: 0

8.1.2 Demolition Phase Assumptions

- General Demolition Information

Area of Building to be demolished (ft^2): 37000
Height of Building to be demolished (ft): 12

- 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

8.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

8.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

8.2 Building Construction Phase

8.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2025

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

8.2.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 65000
Height of Building (ft): 15
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

8.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0287	0.0006	0.2329	0.2666	0.0080	0.0080	0.0025	61.057

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0214	0.0003	0.1373	0.1745	0.0051	0.0051	0.0019	25.650

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

8.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

9. Construction / Demolition

9.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #10: Addition to Weapons Release Facility / ATQZ139764

- Activity Description:
Add to B764 for Weapons Release: 8,948 SF
Repair Weapons Release B764: 5,452 SF
Repair Mun Load Crew Tng B764: 6,093 SF

- Activity Start Date
Start Month: 3
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)

Pollutant	Total Emissions (TONs)

VOC	0.173654
SO_x	0.002602
NO_x	0.619402
CO	1.117918
PM 10	0.022382

PM 2.5	0.019815
Pb	0.000000
NH_3	0.000763
CO_2e	251.2

9.1 Demolition Phase

9.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2025

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

9.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 1000
Height of Building to be demolished (ft): 12

- 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

9.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

9.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

9.2 Building Construction Phase

9.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2025

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

9.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 4000
Height of Building (ft): 15
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	4
Forklifts Composite	2	6

Tractors/Loaders/Backhoes Composite	1	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

9.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

9.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

9.3 Architectural Coatings Phase

9.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 12
Start Quarter: 4
Start Year: 2025

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

9.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 4000
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

9.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

9.3.4 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

10. Construction / Demolition

10.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #11: Mission Training Center / ATQZ259786

- Activity Description:
Construct 1208 SM (13000 SF) 4-ship F-16 MTC facility.

- Activity Start Date
Start Month: 4
Start Month: 2026

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2027

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.354333
SO_x	0.003965
NO_x	1.050948
CO	1.597224
PM 10	0.463728

Pollutant	Total Emissions (TONs)
PM 2.5	0.036791
Pb	0.000000
NH_3	0.001199
CO_2e	387.9

10.1 Site Grading Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

10.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2026

- Phase Duration
Number of Month: 3
Number of Days: 0

10.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 14300
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- 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

10.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60

Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

10.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

10.2 Building Construction Phase

10.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 3
Start Year: 2026

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

10.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 13000
Height of Building (ft): 40
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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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

10.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

10.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

10.3 Architectural Coatings Phase

10.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 3
Start Year: 2027

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

10.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 13000
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

10.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

10.3.4 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

10.4 Paving Phase

10.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 8
Start Quarter: 3
Start Year: 2027

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

10.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 7560

- 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

10.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

10.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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
$VOC_P = (2.62 * PA) / 43560$

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)

11. Construction / Demolition

11.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #15: Construct Fitness Center / ATQZ242304

- Activity Description:
Construct base fitness center (2400 SF)

- Activity Start Date
Start Month: 4
Start Month: 2027

- Activity End Date
Indefinite: False
End Month: 5

End Month: 2028

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.147914
SO_x	0.002428
NO_x	0.590356
CO	0.998394
PM 10	0.045882

Pollutant	Total Emissions (TONs)
PM 2.5	0.019485
Pb	0.000000
NH_3	0.000635
CO_2e	235.2

11.1 Site Grading Phase

11.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2027

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

11.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 2650
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- 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

11.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

11.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

11.2 Building Construction Phase

11.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 6
Start Quarter: 2
Start Year: 2027

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

11.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2400
Height of Building (ft): 15
Number of Units: N/A

- Building Construction Default Settings

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

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	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	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

11.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

11.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

11.3 Architectural Coatings Phase

11.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 4
Start Year: 2028

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

11.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 2400
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

11.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

11.3.4 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

12. Construction / Demolition

12.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #17: Demolish Building 758 / ATQZ012345

- Activity Description:
Demolish B 458 (15,264 SF)

- Activity Start Date
Start Month: 1
Start Month: 2031

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)

Pollutant	Total Emissions (TONs)

VOC	0.050590
SO_x	0.000905
NO_x	0.301503
CO	0.482669
PM 10	0.058653

PM 2.5	0.010527
Pb	0.000000
NH_3	0.000346
CO_2e	89.8

12.1 Demolition Phase

12.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2031

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

12.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 15264
Height of Building to be demolished (ft): 15

- 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

12.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0336	0.0006	0.2470	0.3705	0.0093	0.0093	0.0030	58.539
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

12.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

13. Construction / Demolition

13.1 General Information & Timeline Assumptions

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #9: Hydrazine Storage Facility / ATQZ252123

- Activity Description:
Construct hydrazine storage facility. (200 SF)
Only fuel containers would be stored (each holding 6.8 gallons).
Hydrazine is regionally serviced elsewhere. Maximum daily amount would be less than 1,000 gallons.

- Activity Start Date
Start Month: 4
Start Month: 2025

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.034558
SO_x	0.000613
NO_x	0.171187

Pollutant	Total Emissions (TONs)
PM 2.5	0.006208
Pb	0.000000
NH_3	0.000116

CO	0.232411
PM 10	0.011189

CO_2e	60.3

13.1 Site Grading Phase

13.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 2
Start Year: 2025

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

13.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 500
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- 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

13.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

13.1.4 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

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

13.2 Building Construction Phase

13.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 2
Start Year: 2025

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

13.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 500
Height of Building (ft): 15
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	4
Forklifts Composite	2	6

Tractors/Loaders/Backhoes Composite	1	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

13.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

13.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

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

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
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

13.3 Architectural Coatings Phase

13.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 3
Start Year: 2025

- Phase Duration
Number of Month: 0
Number of Days: 14

13.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 200
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

13.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.302	000.002	000.228	003.466	000.008	000.007		000.023	00327.295
LDGT	000.380	000.003	000.396	004.764	000.010	000.009		000.024	00420.624
HDGV	000.724	000.005	001.035	015.624	000.023	000.020		000.045	00769.345
LDDV	000.121	000.003	000.131	002.421	000.004	000.004		000.008	00316.352
LDDT	000.261	000.004	000.373	004.143	000.007	000.006		000.008	00448.263
HDDV	000.484	000.013	004.881	001.721	000.171	000.157		000.028	01489.893
MC	002.411	000.003	000.762	013.385	000.027	000.024		000.053	00396.878

13.3.4 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

14. Aircraft

14.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: A-10 Operations at Fort Wayne ANGB local airfield (REMOVE)

- Activity Description:
The A-10 is being replaced at Fort Wayne ANGB.

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-30.493466
SO_x	-1.393160
NO_x	-5.710949
CO	-86.838935
PM 10	-8.857763

Pollutant	Emissions Per Year (TONs)
PM 2.5	-3.951604
Pb	0.000000
NH_3	0.000000
CO_2e	-4210.7

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

Pollutant	Emissions Per Year (TONs)
VOC	-30.493466
SO_x	-1.393160
NO_x	-5.710949
CO	-86.838935
PM 10	-8.857763

Pollutant	Emissions Per Year (TONs)
PM 2.5	-3.951604
Pb	0.000000
NH_3	0.000000
CO_2e	-4210.7

14.2 Aircraft & Engines

14.2.1 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:

14.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

14.3 Flight Operations

14.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 21
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 3666
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 366
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 18.5 (default)
Takeoff [Military] (mins): 0.4 (default)
Takeoff [After Burn] (mins): 0 (default)
Climb Out [Intermediate] (mins): 0.8 (default)
Approach [Approach] (mins): 3.5 (default)
Taxi/Idle In [Idle] (mins): 11.3 (default)

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

- Trim Test

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

14.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

14.4 Auxiliary Power Unit (APU)

14.4.1 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

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

14.4.3 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

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15. Aircraft

15.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: F-16 Operations at Fort Wayne ANGB local airfield ADD

- Activity Description:

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	15.058625
SO_x	3.674219
NO_x	36.006984
CO	52.008507
PM 10	5.960072

Pollutant	Emissions Per Year (TONs)
PM 2.5	5.217454
Pb	0.000000
NH_3	0.000000
CO_2e	10414.7

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

Pollutant	Emissions Per Year (TONs)
VOC	15.058625
SO_x	3.674219
NO_x	36.006984
CO	52.008507
PM 10	5.960072

Pollutant	Emissions Per Year (TONs)
PM 2.5	5.217454
Pb	0.000000
NH_3	0.000000
CO_2e	10414.7

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

Pollutant	Emissions Per Year (TONs)
VOC	0.000000
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

15.2 Aircraft & Engines

15.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-16C

Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 1

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

15.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1084.00	7.94	1.07	4.61	35.30	2.06	1.85	3234
Approach	3837.00	5.12	1.07	12.53	1.92	2.63	2.37	3234
Intermediate	5770.00	2.89	1.07	22.18	0.86	2.06	1.85	3234
Military	9679.00	1.79	1.07	29.32	0.86	1.33	1.20	3234
After Burn	41682.00	1.53	1.07	8.37	11.99	1.15	1.04	3234

15.3 Flight Operations

15.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 24
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 3666
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 734
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

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

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

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

15.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year
AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

15.4 Auxiliary Power Unit (APU)

15.4.1 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
1	1	No	T-62T-40-8	

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
T-62T-40-8	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

15.4.3 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

15.5 Aerospace Ground Equipment (AGE)

15.5.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: No

- AGE Usage

Number of Annual LTO (Landing and Take-off) cycles for AGE: 3666

- Aerospace Ground Equipment (AGE)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	2	Yes	Fuel Truck	Fuel Truck

15.5.2 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	CO_2e
Fuel Truck	16.4	0.300	0.480	3.300	0.900	0.210	0.204	373.0

15.5.3 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

16. Aircraft

16.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Decatur; Jackson; Jefferson; Jennings; Ripley; Scott; Washington
Regulatory Area(s): Jackson Co, IN

- Activity Title: F-16 Operations in JPG MOAs/R-3403 under 3,000 feet ADD

- Activity Description:
compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 1410 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.203820
SO_x	0.121834
NO_x	3.335120
CO	0.099686
PM 10	0.151324

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.136492
Pb	0.000000
NH_3	0.000000
CO_2e	368.3

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

Pollutant	Emissions Per Year (TONs)
VOC	0.203820
SO_x	0.121834
NO_x	3.335120
CO	0.099686
PM 10	0.151324

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.136492
Pb	0.000000
NH_3	0.000000
CO_2e	368.3

16.2 Aircraft & Engines

16.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: F-16C
Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate

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

16.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1084.00	7.94	1.07	4.61	35.30	2.06	1.85	3234
Approach	3837.00	5.12	1.07	12.53	1.92	2.63	2.37	3234
Intermediate	5770.00	2.89	1.07	22.18	0.86	2.06	1.85	3234
Military	9679.00	1.79	1.07	29.32	0.86	1.33	1.20	3234
After Burn	41682.00	1.53	1.07	8.37	11.99	1.15	1.04	3234

16.3 Flight Operations

16.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 1410
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 0
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (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

16.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

16.4 Auxiliary Power Unit (APU)

16.4.1 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
1	1	No	T-62T-40-8	

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
T-62T-40-8	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

16.4.3 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

17. Aircraft

17.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Decatur; Jackson; Jefferson; Jennings; Ripley; Scott
Regulatory Area(s): Jackson Co, IN

- Activity Title: A-10 Operations in JPG MOAs/R-3403 under 3,000 feet REMOVE

- Activity Description:
Compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 4892 minutes/year ~3K ft AGL (over-estimate).

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.025410
SO_x	-0.236422
NO_x	-2.364222
CO	-0.486102
PM 10	-0.587741

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.371205
Pb	0.000000
NH_3	0.000000
CO_2e	-714.6

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

Pollutant	Emissions Per Year (TONs)
VOC	-0.025410
SO_x	-0.236422
NO_x	-2.364222
CO	-0.486102
PM 10	-0.587741

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.371205
Pb	0.000000
NH_3	0.000000
CO_2e	-714.6

17.2 Aircraft & Engines

17.2.1 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:

17.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

17.3 Flight Operations

17.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 4892
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 0
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (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

17.3.2 Flight Operations Formula(s)

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

17.4 Auxiliary Power Unit (APU)

17.4.1 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

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

17.4.3 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

18. Heating

18.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #10 Addition to Weapons Release Facility

- Activity Description:
Proposed Action includes three new additions/construction projects.
#10 would be an 8,980 SF addition.

- Activity Start Date
Start Month: 1

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Start Year: 2026

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.001757
SO_x	0.000192
NO_x	0.031943
CO	0.026832
PM 10	0.002428

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.002428
Pb	0.000000
NH_3	0.000000
CO_2e	38.5

18.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 8980
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0747

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

18.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

18.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant

2000: Conversion Factor pounds to tons

19. Heating

19.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #15 Construct Fitness Center

- Activity Description:
Proposed Action includes three new additions/construction projects.
#15 would be an 2400 SF facility.

- Activity Start Date
Start Month: 1
Start Year: 2028

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.000682
SO_x	0.000074
NO_x	0.012400
CO	0.010416
PM 10	0.000942

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000942
Pb	0.000000
NH_3	0.000000
CO_2e	14.9

19.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 2400
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.1085

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

19.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

19.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

20. Heating

20.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #03 Munitions MX and Storage Climate Control

- Activity Description:

Proposed Action includes three new additions/construction projects.
#03 would be multiple facilities for the storage and maintenance of munitions totaling 18440 SF.
Though used for storage, these facilities are included to account for climate control of munitions.

- Activity Start Date

Start Month: 1
Start Year: 2024

- Activity End Date

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.003555

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.004912

SO_x	0.000388
NO_x	0.064628
CO	0.054287
PM 10	0.004912

Pb	0.000000
NH_3	0.000000
CO_2e	77.8

20.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 18440
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0736

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

20.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

20.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

21. Heating

21.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

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- Activity Location
County: Allen
Regulatory Area(s): Fort Wayne, IN

- Activity Title: #11 Mission Training Center

- Activity Description:
Proposed Action includes new additions/construction projects.
#11 would be an 13000 SF facility.

- Activity Start Date
Start Month: 1
Start Year: 2027

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.002506
SO_x	0.000273
NO_x	0.045562
CO	0.038272
PM 10	0.003463

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.003463
Pb	0.000000
NH_3	0.000000
CO_2e	54.9

21.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 13000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value ($MMBtu/ft^3$): 0.00105
Energy Intensity ($MMBtu/ft^2$): 0.0736

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

21.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

21.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

22. Aircraft

22.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location

County: Cass; Fulton; Miami; Pulaski; White
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: F-16 Operations in Twelve Mile MOAs under 3,000 feet ADD

- Activity Description:

compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 2169 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date

Start Month: 10
Start Year: 2022

- Activity End Date

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

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.017918
SO_x	0.172042
NO_x	5.514168
CO	0.091844
PM 10	0.253895

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.228144
Pb	0.000000
NH_3	0.000000
CO_2e	520.0

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

Pollutant	Emissions Per Year (TONs)
VOC	0.017918
SO_x	0.172042

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.228144
Pb	0.000000

NO_x	5.514168
CO	0.091844
PM 10	0.253895

NH_3	0.000000
CO_2e	520.0

22.2 Aircraft & Engines

22.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: F-16C
Engine Model: F100-PW-200
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 1

- Aircraft & Engine Surrogate

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

22.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1005.95	2.05	1.07	6.21	24.06	2.49	2.24	3234
Approach	3251.45	0.05	1.07	17.93	1.22	2.37	2.13	3234
Intermediate	5650.65	0.07	1.07	26.55	0.38	1.58	1.42	3234
Military	8888.05	0.11	1.07	34.32	0.56	1.58	1.42	3234
After Burn	40122.70	0.69	1.07	6.63	10.42	3.04	2.74	3234

22.3 Flight Operations

22.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 2169
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 0
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (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

22.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

22.4 Auxiliary Power Unit (APU)

22.4.1 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
1	1	No	T-62T-40-8	

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
T-62T-40-8	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

22.4.3 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

23. Aircraft

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

23.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Adams; Fayette; Highland; Pike; Ross; Scioto
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: F-16 Operations in Brush Creek MOA under 3,000 feet ADD

- Activity Description:
compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 2470 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.356861
SO_x	0.213316
NO_x	5.841917
CO	0.173214
PM 10	0.265036

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.239090
Pb	0.000000
NH_3	0.000000
CO_2e	644.8

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

Pollutant	Emissions Per Year (TONs)
VOC	0.356861
SO_x	0.213316
NO_x	5.841917
CO	0.173214
PM 10	0.265036

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.239090
Pb	0.000000
NH_3	0.000000
CO_2e	644.8

23.2 Aircraft & Engines

23.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-16C
Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 1

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

Original Engine Name:

23.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1084.00	7.94	1.07	4.61	35.30	2.06	1.85	3234
Approach	3837.00	5.12	1.07	12.53	1.92	2.63	2.37	3234
Intermediate	5770.00	2.89	1.07	22.18	0.86	2.06	1.85	3234
Military	9679.00	1.79	1.07	29.32	0.86	1.33	1.20	3234
After Burn	41682.00	1.53	1.07	8.37	11.99	1.15	1.04	3234

23.3 Flight Operations

23.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 2470
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 0
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (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

23.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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

LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

23.4 Auxiliary Power Unit (APU)

23.4.1 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
1	1	No	T-62T-40-8	

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
T-62T-40-8	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

23.4.3 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

24. Aircraft

24.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Bartholomew; Brown; Johnson; Jackson; Jefferson
Regulatory Area(s): Indianapolis, IN; Jackson Co, IN

- Activity Title: F-16 Operations in Racer MOAs/R-3401 under 3,000 feet ADD

- Activity Description:
compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 330 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date
Start Month: 10
Start Year: 2022

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- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.047891
SO_x	0.028625
NO_x	0.781026
CO	0.024770
PM 10	0.035466

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.031959
Pb	0.000000
NH_3	0.000000
CO_2e	86.5

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

Pollutant	Emissions Per Year (TONs)
VOC	0.047891
SO_x	0.028625
NO_x	0.781026
CO	0.024770
PM 10	0.035466

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.031959
Pb	0.000000
NH_3	0.000000
CO_2e	86.5

24.2 Aircraft & Engines

24.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: F-16C
Engine Model: F100-PW-220
Primary Function: Combat
Aircraft has After burn: Yes
Number of Engines: 1

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

24.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	1084.00	7.94	1.07	4.61	35.30	2.06	1.85	3234
Approach	3837.00	5.12	1.07	12.53	1.92	2.63	2.37	3234
Intermediate	5770.00	2.89	1.07	22.18	0.86	2.06	1.85	3234
Military	9679.00	1.79	1.07	29.32	0.86	1.33	1.20	3234
After Burn	41682.00	1.53	1.07	8.37	11.99	1.15	1.04	3234

24.3 Flight Operations

24.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 1

Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	0
Takeoff [Military] (mins):	330
Takeoff [After Burn] (mins):	0
Climb Out [Intermediate] (mins):	0
Approach [Approach] (mins):	0
Taxi/Idle In [Idle] (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

24.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

24.4 Auxiliary Power Unit (APU)

24.4.1 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
1	1	No	T-62T-40-8	

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

T-62T-40-8	272.6	0.493	0.289	1.216	3.759	0.131	0.037	910.8

24.4.3 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

25. Aircraft

25.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Cass; Fulton; Jasper; Miami; Pulaski
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: A-10 Operations in Twelve Mile MOAs under 3,000 feet REMOVE

- Activity Description:
compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 7033.05 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.036531
SO_x	-0.339896
NO_x	-3.398956
CO	-0.698851
PM 10	-0.844974

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.533668
Pb	0.000000
NH_3	0.000000
CO_2e	-1027.3

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

Pollutant	Emissions Per Year (TONs)
VOC	-0.036531
SO_x	-0.339896

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.533668
Pb	0.000000

NO_x	-3.398956
CO	-0.698851
PM 10	-0.844974

NH_3	0.000000
CO_2e	-1027.3

25.2 Aircraft & Engines

25.2.1 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:

25.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

25.3 Flight Operations

25.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 7033.05
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 0
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (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

25.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

25.4 Auxiliary Power Unit (APU)

25.4.1 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

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

25.4.3 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

26. Aircraft

26.1 General Information & Timeline Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Jackson; Johnson; Brown; Bartholomew; Jefferson
Regulatory Area(s): Jackson Co, IN; Indianapolis, IN

- Activity Title: A-10 Operations in Racer MOAs/R-3401 under 3,000 feet REMOVE

- Activity Description:
compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 480 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.002493
SO_x	-0.023198
NO_x	-0.231976
CO	-0.047696
PM 10	-0.057669

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.036422
Pb	0.000000
NH_3	0.000000
CO_2e	-70.1

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

Pollutant	Emissions Per Year (TONs)
VOC	-0.002493
SO_x	-0.023198
NO_x	-0.231976
CO	-0.047696
PM 10	-0.057669

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.036422
Pb	0.000000
NH_3	0.000000
CO_2e	-70.1

26.2 Aircraft & Engines

26.2.1 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:

26.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

26.3 Flight Operations

26.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 480
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 0
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (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

26.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

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

AE_{TGO}: Aircraft Emissions (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)

26.4 Auxiliary Power Unit (APU)

26.4.1 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

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

26.4.3 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

27. Aircraft

27.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Remove

- Activity Location
County: Adams; Fayette; Highland; Pike; Ross; Scioto
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: A-10 Operations in Brush Creek MOA under 3,000 feet REMOVE

- Activity Description:
compiled ops under 3,000 feet using any ops within these altitude bands from the ops tables used in noise analysis.

Total of 240 minutes/year ~3K ft AGL (over-estimate)

- Activity Start Date
Start Month: 10
Start Year: 2022

- Activity End Date
Indefinite: Yes
End Month: N/A

End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	-0.001247
SO_x	-0.011599
NO_x	-0.115988
CO	-0.023848
PM 10	-0.028834

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.018211
Pb	0.000000
NH_3	0.000000
CO_2e	-35.1

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

Pollutant	Emissions Per Year (TONs)
VOC	-0.001247
SO_x	-0.011599
NO_x	-0.115988
CO	-0.023848
PM 10	-0.028834

Pollutant	Emissions Per Year (TONs)
PM 2.5	-0.018211
Pb	0.000000
NH_3	0.000000
CO_2e	-35.1

27.2 Aircraft & Engines

27.2.1 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:

27.2.2 Aircraft & Engines Emission Factor(s)

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

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	390.00	39.45	1.07	2.10	106.70	8.13	3.60	3234
Approach	920.00	2.19	1.07	5.70	16.30	6.21	2.12	3234
Intermediate	460.00	23.35	1.07	2.60	78.00	8.93	6.95	3234
Military	2710.00	0.12	1.07	10.70	2.20	2.66	1.68	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

27.3 Flight Operations

27.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 1
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	0
Takeoff [Military] (mins):	240
Takeoff [After Burn] (mins):	0
Climb Out [Intermediate] (mins):	0
Approach [Approach] (mins):	0
Taxi/Idle In [Idle] (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

27.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

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

AEM_{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
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

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

AE_{LTO}: 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 TGOs per Year

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

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
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (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)

27.4 Auxiliary Power Unit (APU)

27.4.1 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

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

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

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

27.4.3 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

APPENDIX F
LAND USE COMPATIBILITY GUIDELINES

Table F-1 Department of Defense Land Use Compatibility in Aircraft Noise Zones

APPENDIX 3A: RECOMMENDED LAND USE COMPATIBILITY IN AIRCRAFT NOISE ZONES

3A.1. Table 2 provides compatibility recommendations based on yearly DNL or CNEL on and around installations. The primary land use objective is to discourage noise-sensitive land uses in areas of higher noise exposure.

3A.2. The table is organized based on SLUCM categories; however, it varies from SLUCM as the coding system does not differentiate based on noise-sensitivity. Some uses warrant additional evaluation due to potential for annoyance and activity interference. General notes and specific footnotes at the bottom of the table provide additional information and considerations for compatibility determinations.

3A.3. These recommendations are intended to support compatible land use planning both on- and off-base; they do not constitute a Federal determination that any use of land is acceptable or unacceptable under local zoning.

Table 1. Land Use Compatibility In Aircraft Noise Zones

Land use Name and SLUCM Category	A-weighted DNL/CNEL levels					
	<65 decibel (dB)	65-70 dB	70-75 dB	75-80 dB	80-85 dB	85 dB
Residential use group (SLUCM Category 10)						
Residential uses, inclusive of all residential units (i.e. any type of single or multiple dwelling units).	Y	N[1]	N[1]	N	N	N
Mobile home parks or courts	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
Manufacturing use group (SLUCM Categories 20 and 30)						
Manufacturing and industrial uses	Y	Y	Y[2]	Y[3]	Y[4]	N
Precision manufacturing	Y	Y	Y[2]	Y[3]	N	N
Transportation, communication and utilities use group (SLUCM Category 40)						
Rail, motor vehicle, aircraft, marine, and other transportation, and communication systems and utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Highway and street right-of-way, automobile parking	Y	Y	Y	Y	Y	N
Telephone, cellular and radio communication	Y	Y	Y[2]	Y[3]	N	N
Trade use group (SLUCM Category 50)						
Wholesale trade	Y	Y	Y[2]	Y[3]	Y[4]	N
Building materials, hardware and farm equipment sales	Y	Y	Y[2]	Y[3]	Y[4]	N
Mass retailing, super stores, strip malls, shopping centers, discount clubs, home improvement stores, etc.; eating and drinking establishments	Y	Y	Y[2]	Y[3]	N	N

Table 2. Land Use Compatibility in Aircraft Noise Zones, Continued

Land use name and SLUCM Category	A-weighted DNL/CNEL levels					
	<65 dB	65-70 dB	70-75 dB	75-80 dB	80-85 dB	85 dB
Services use group (SLUCM Category 60)						
Finance, insurance and real estate, personal, professional and miscellaneous services; religious activities	Y	Y	Y[2]	Y[3]	N	N
Cemeteries	Y	Y	Y[2]	Y[3]	Y[4]	Y[5]
Warehousing or storage and repair services	Y	Y	Y[2]	Y[3]	Y[4]	N
Hospitals or medical, child care and development services, educational facilities	Y	Y[2]	Y[3]	N	N	N
Nursing homes	Y	N[1]	N[1]	N	N	N
Governmental	Y	Y	Y[2]	Y[3]	N	N
Cultural, entertainment, and recreational use group (SLUCM Category 70)						
Cultural activities, auditoriums and concert halls	Y	Y[2]	Y[3]	N	N	N
Nature exhibits	Y	Y	N	N	N	N
Public assembly	Y	Y	N	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Outdoor sports arenas, spectator sports	Y	Y[6]	Y[6]	N	N	N
Amusements	Y	Y	Y	N	N	N
Outdoor recreational activities	Y	Y	Y[2]	Y[3]	N	N
Resorts, camps, parks and other cultural, entertainment, and recreational activities	Y	Y	Y[2]	N	N	N
Resource production and extraction use group (SLUCM Category 80)						
Agriculture and forestry	Y	Y[7]	Y[8]	Y[9]	Y[9]	Y[9]
Livestock farming, animal breeding	Y	Y[7]	Y[8]	N	N	N
Fishing, mining, and other resource production or extraction	Y	Y	Y	Y	Y	Y

Key to Table 2 – Land use compatibility in aircraft noise zones

Land use recommendations

Y (Yes) – Land use and related structures compatible without restrictions.

N (No) – Land use and related structures are not compatible and should be prohibited.

Y[x] – Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

N[x] – No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

Notes for Table 2 – Land use compatibility in aircraft noise zones

General notes for all uses:

a. Compatibility designations in Table 2 generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, a determination of compatibility should be based on that use which is most adversely affected by noise and its contribution to the successful use of the property.

b. Where a proposed development falls within two DNL or CNEL noise zones, the land use recommendations of the higher noise zone should be used. For example, if a proposed development is exposed to 70 dB DNL or CNEL, land use recommendations for the 70-75 dB DNL or CNEL noise zone should be applied

Table 2. Land Use Compatibility in Aircraft Noise Zones, Continued

Notes for Table 2 – Land Use Compatibility in Aircraft Noise Zones, Continued

c. When appropriate, noise level reduction (NLR) may be necessary to achieve compatibility. NLR (outdoor to indoor) is achieved through the incorporation of sound attenuation into the design and construction of a structure. Measures to achieve an indoor noise reduction do not necessarily solve noise issues outside the structure and additional evaluation may be warranted. Building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure, particularly from aircraft ground maintenance run-ups. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

d. All land uses are generally compatible with noise below 65dB DNL. However, localities, when evaluating the application of these guidelines, should consider possible annoyance tied to land uses that involve predominately outdoor activities, or where quiet is a basis for the use.

e. Land uses that involve outdoor activities in areas above 80dB DNL are not recommended.

Footnotes for Table 2 – Land Use Compatibility in Aircraft Noise Zones

Footnotes specific to certain land uses:

1. Residential
   a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-70 and strongly discouraged above DNL 70. The absence of viable alternative development options should be determined, and an evaluation should be conducted locally prior to local approvals. These evaluations should clearly demonstrate that the community's need for additional residential property could not be met if development were prohibited in these zones, and that the expense of additional noise attenuation will not undermine affordable housing goals.
   b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB in DNL 65-70 and 30 dB in DNL 70-75 should be incorporated into building codes, and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-80.
   c. Normal permanent construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year-round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
5. Buildings where public is received, are not recommended.
6. Land use is compatible provided special sound reinforcement systems are installed.
7. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 25 dB should be incorporated into the design.
8. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 30 dB should be incorporated into the design.
9. Residences are not compatible.

Table F-2 FAA Land Use Compatibility in Aircraft Noise Zones

TABLE 1—LAND USE COMPATIBILITY* WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						

Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

KEY TO TABLE 1

SLUCM = Standard Land Use Coding Manual.

Y (Yes) = Land Use and related structures compatible without restrictions.

N (No) = Land Use and related structures are not compatible and should be prohibited.

NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

NOTES FOR TABLE 1

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

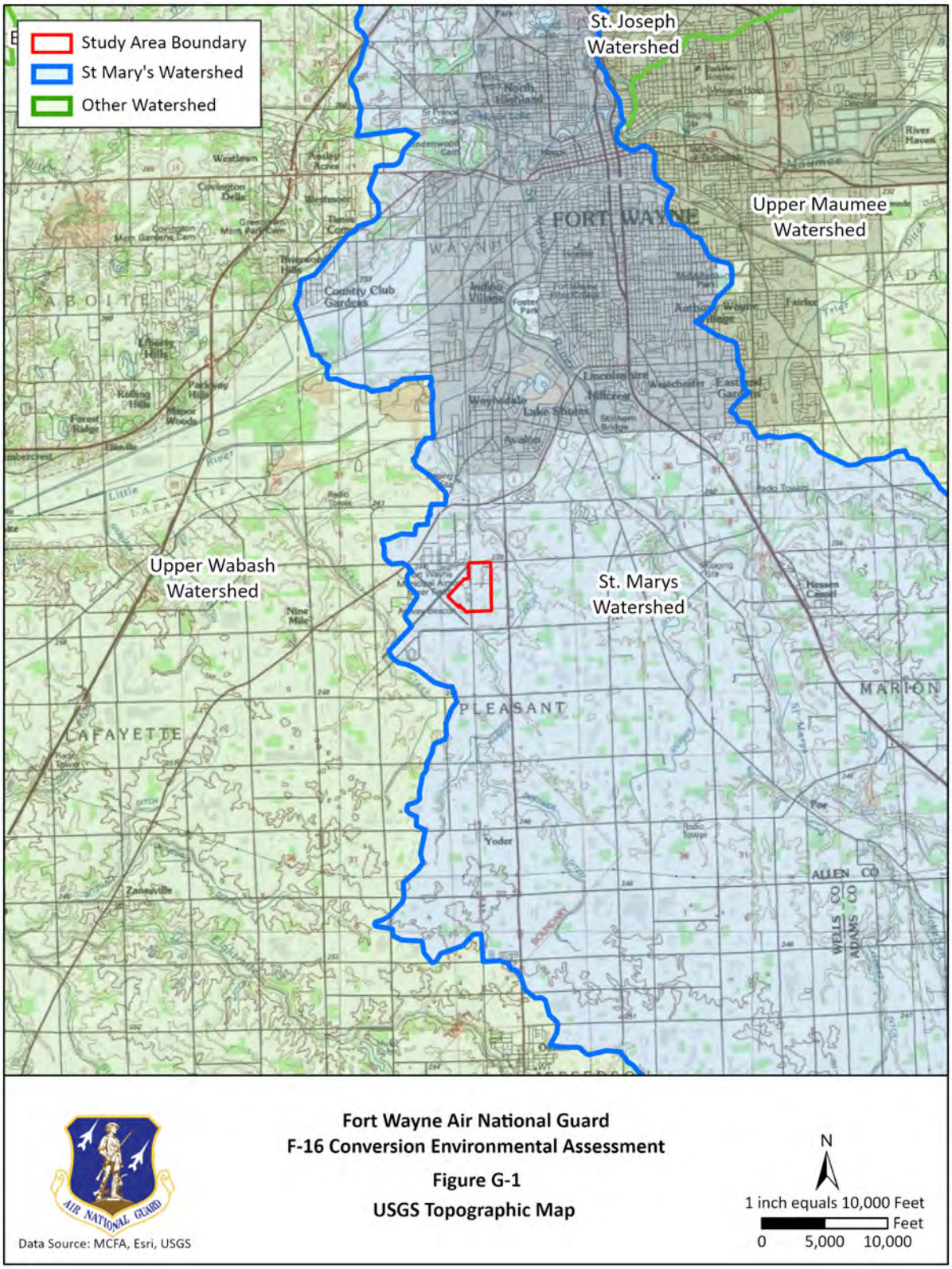
(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

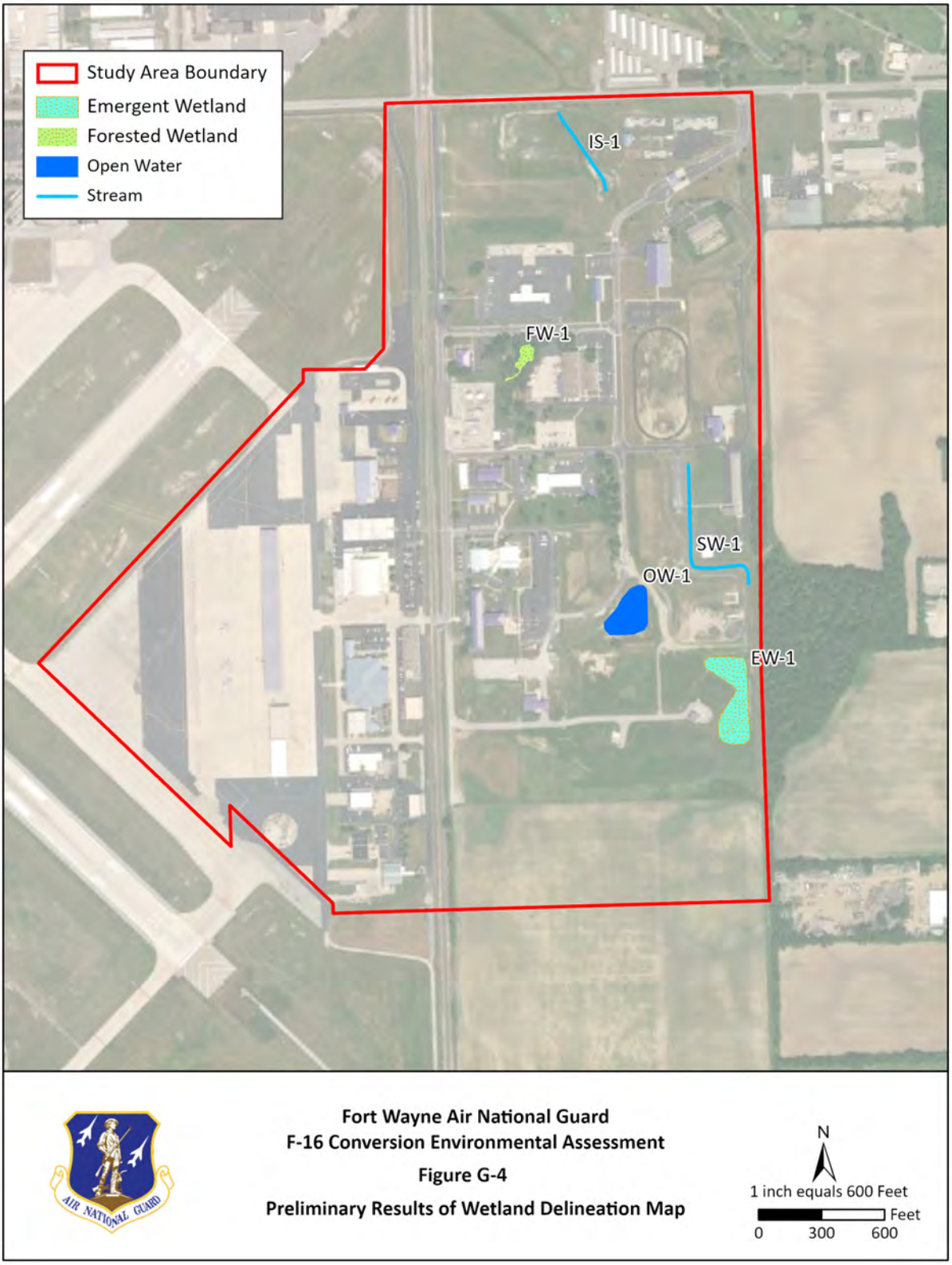
(8) Residential buildings not permitted.

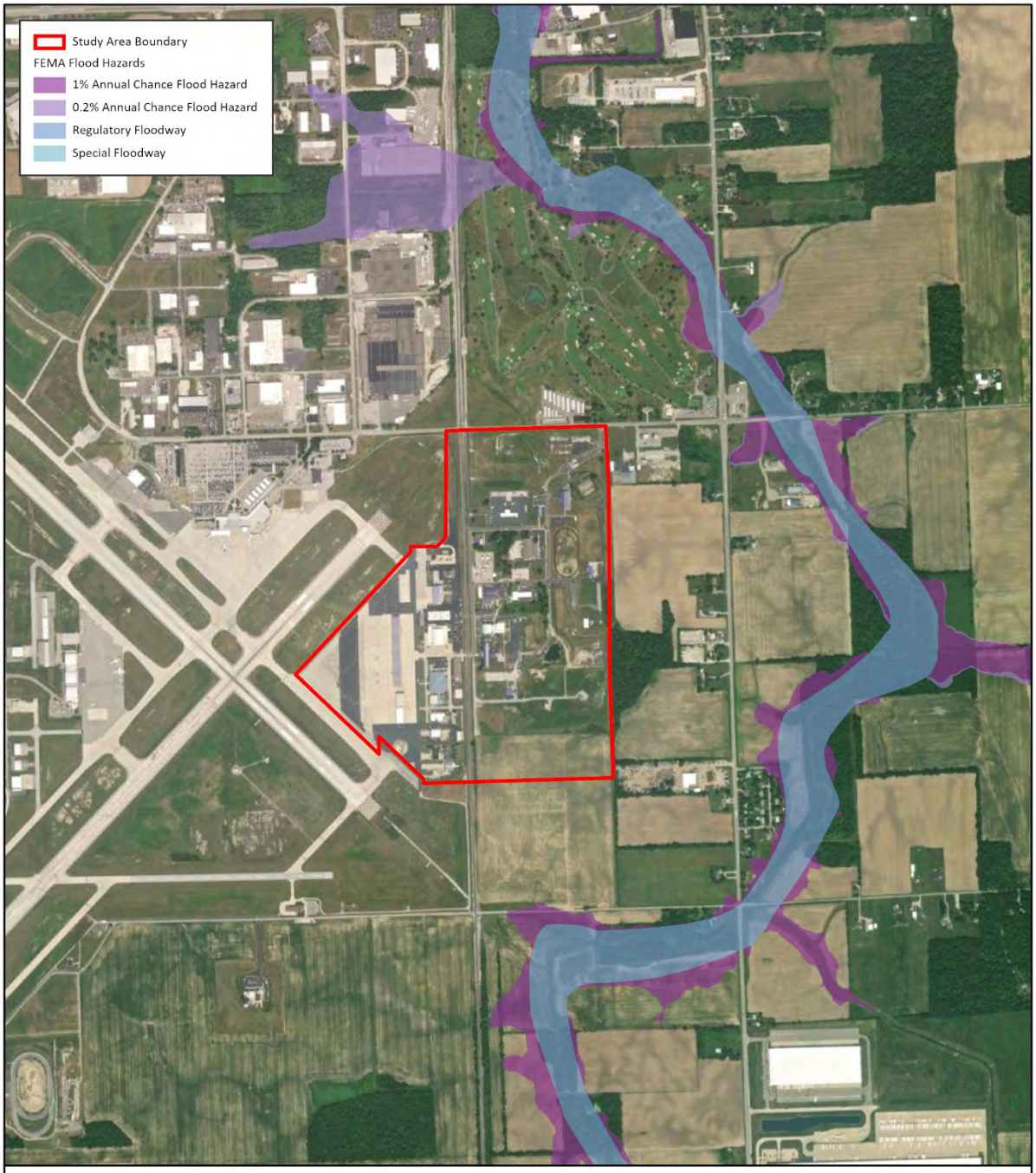
APPENDIX G
AERIAL PHOTOS AND TOPOGRAPHIC MAPS

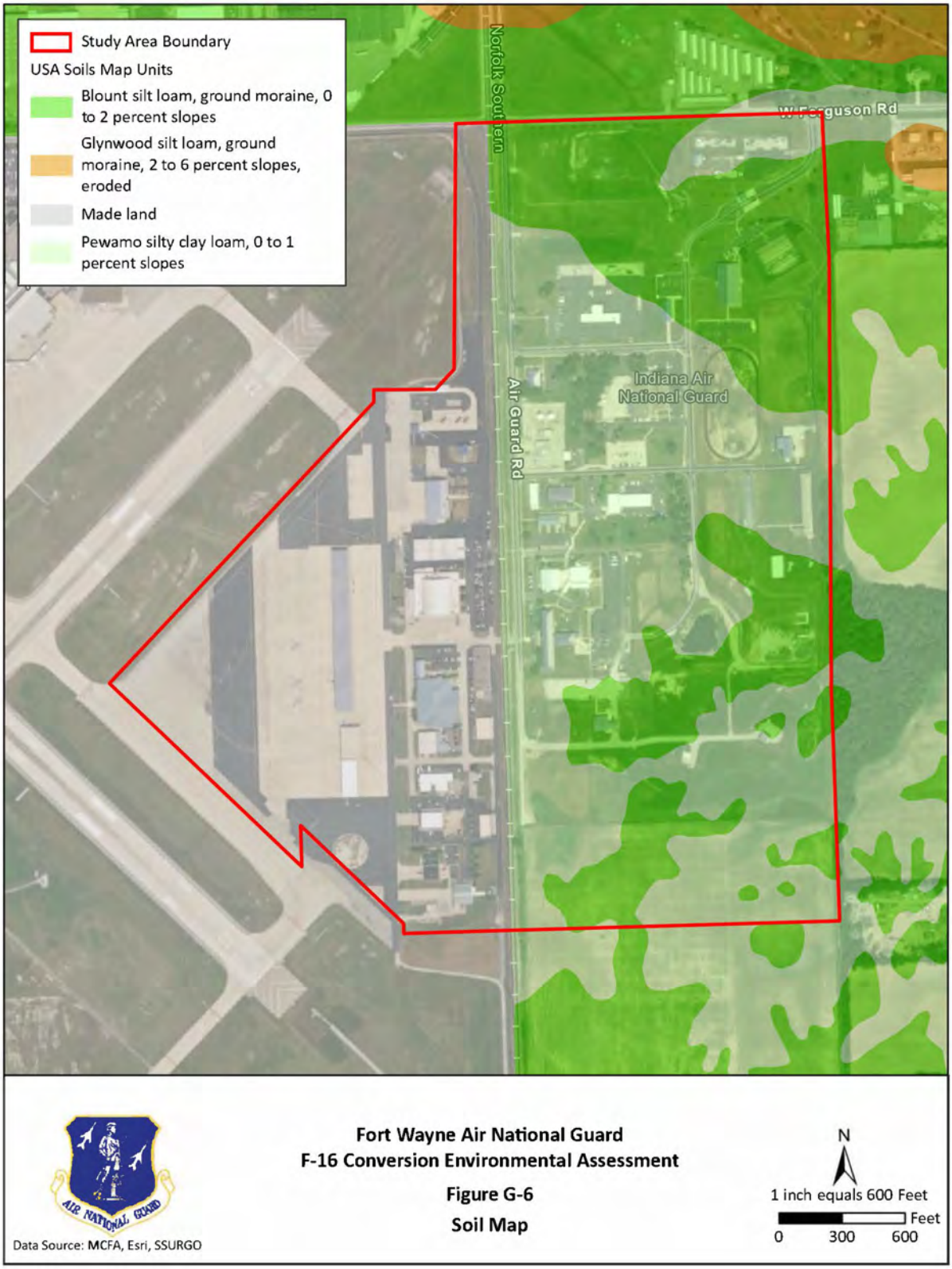

Study Area Boundary
St Mary's Watershed
Other Watershed
St. Joseph Watershed
Upper Maumee Watershed
Upper Wabash Watershed
St. Marys Watershed
FORT WAYNE
WAYNE
PLEASANT
LAFAYETTE
MARION
ALLEN CO
WELLS CO
ADAMS CO
Data Source: MCFA, Esri, USGS
Fort Wayne Air National Guard
F-16 Conversion Environmental Assessment
Figure G-1
USGS Topographic Map
N
1 inch equals 10,000 Feet
0 5,000 10,000 Feet


Study Area Boundary
W Ferguson Rd
10th
Air St
Norfolk Southern
Air Guard Rd
Indiana Air National Guard
Fort Wayne Air National Guard
F-16 Conversion Environmental Assessment
Figure G-2
Aerial Imagery Map
Data Source: MCFA, Esri
N
1 inch equals 600 Feet
Feet
0
300
600


Study Area Boundary
USA Wetlands
Palustrine
Riverine
W Ferguson Rd
Air St
10th
Norfolk Southern
Air Guard Rd
Indiana Air National Guard
W Ferguson Rd
Fort Wayne Air National Guard
F-16 Conversion Environmental Assessment
Figure G-3
National Wetland Inventory Map
Data Source: MCFA, Esri, NWI
N
1 inch equals 600 Feet
Feet
0
300
600


Study Area Boundary
Emergent Wetland
Forested Wetland
Open Water
Stream
IS-1
FW-1
SW-1
OW-1
EW-1
Fort Wayne Air National Guard
F-16 Conversion Environmental Assessment
Figure G-4
Preliminary Results of Wetland Delineation Map
N
1 inch equals 600 Feet
Feet
0
300
600


Study Area Boundary
FEMA Flood Hazards
1% Annual Chance Flood Hazard
0.2% Annual Chance Flood Hazard
Regulatory Floodway
Special Floodway
AIR NATIONAL GUARD
Data Source: MCFA, Esri
Fort Wayne Air National Guard
F-16 Conversion Environmental Assessment
Figure G-5
FEMA Flood Hazards
N
1 inch equals 1,500 feet
Feet
0
750
1,500


Study Area Boundary
USA Soils Map Units
Blount silt loam, ground moraine, 0 to 2 percent slopes
Glynwood silt loam, ground moraine, 2 to 6 percent slopes, eroded
Made land
Pewamo silty clay loam, 0 to 1 percent slopes
Norfolk Southern
W Ferguson Rd
Air Guard Rd
Indiana Air National Guard
Fort Wayne Air National Guard
F-16 Conversion Environmental Assessment
Figure G-6
Soil Map
Data Source: MCFA, Esri, SSURGO
N
1 inch equals 600 Feet
Feet
0
300
600

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