DRAFT
FINDING OF NO SIGNIFICANT IMPACT
ENHANCED USE LEASE
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Parts 1500 - 1508, and Department of the Air Force (DAF) regulations, 32 CFR Part 989, an environmental assessment (EA) has been prepared analyzing impacts associated with an Enhanced Use Lease (EUL) at Wright-Patterson Air Force Base (WPAFB, the Base), Ohio. The EA is attached and incorporated by reference.

The 88 Air Base Wing (88 ABW) proposes to enter into an EUL agreement for future development of two WPAFB property parcels. Executive Order (EO) 13327, *Federal Real Property Asset Management*, establishes "*It is the policy of the United States to promote the efficient and economical use of America's real property assets and to assure management accountability for implementing federal real property management reforms*." The EUL program allows the DoD to, under the authority of 10 United States Code (USC) §2667, lease real property under its control that is not needed for public use and is not excess property, and which would meet the specified lease conditions in the statute. This mechanism then allows a private party to use proceeds resulting from development on the leased property to support a goal stipulated by the DoD. The proposed EUL is expected to enhance the value of those unused parcels to complement existing and future DAF and other WPAFB tenant operations.

Purpose and Need (EA §1.3, page 1-3): The purpose of the Proposed Action is to promote the efficient and economical use of real property assets at WPAFB pursuant to the directives of EO 13327, Federal Real Property Asset Management. The need for the action is to create additional value of underutilized WPAFB land through the potential development of commercial facilities, infrastructure and assets enhancing existing and future WPAFB research and development, science and technology, and education operations. In leasing the land to a private EUL developer, the DAF is meeting its strategic goal of optimizing the value of its existing lands.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Eleven alternatives were initially considered with the proposed Hilltop site and proposed former Gerlaugh Farm site being carried forward and further analyzed in the EA (EA Table 2-1, pages 2-5 to 2-6). The Proposed Action of entering into an EUL agreement for the Hilltop site and the former Gerlaugh Farm site met all selection standards; therefore, this action along with the No Action Alternative were carried forward for further evaluation.

Proposed Action (EA§2.4.1, pages 2-3 to 2-5): The 88 ABW is proposing to enter into an EUL with a private developer to construct new commercial facilities at the Hilltop Parcel and the Gerlaugh Farm Parcel on and near WPAFB Area B. The development on both sites would consist primarily of phased construction of office buildings, and may include a limited amount of retail, restaurant, and hotel space on the Hilltop Parcel. Both proposed sites are currently unoccupied.

The existing 22.0-acre Hilltop Parcel is primarily maintained open space with walking trails east of the Air Force Institute of Technology (AFIT) and west of National Road. While the Parcel is currently within the WPAFB fence, the fence would be relocated to the north, west, and south borders of the

Parcel to allow direct public access to the new development via new entrances off National Road. The Hilltop Parcel development at maximum buildout would consist of 7 new buildings totaling approximately 405,000 gross square feet (gsf). Construction would begin at the south end of the parcel and work its way to the north in phases as tenant demand for research and development (R&D) office space dictates. A pedestrian plaza would be constructed along the north-south spine of the development to promote pedestrian circulation and access to public amenities available in Buildings 1, 2, and 4. Site work and construction of Buildings 1 and 2 would commence in 2025, followed by Building 4 in 2026. Construction of the remaining four buildings would continue in phases based on market demand, potentially through 2035. Utility connections would be made from existing utility services in or along National Road. Site access would be from at least two new entrances off National Road. The developer will incorporate additional traffic feature improvements as part of design per the Greene Co. Traffic Study completed for the Hilltop parcel.

The existing 21.9-acre Gerlaugh Farm Parcel is primarily maintained open space between the Properties at Wright Field to the west and the I-675/Colonel Glenn Highway interchange. The Parcel is across from Area B, south of the Colonel Glenn Highway, and is accessed and bisected by Mission Point Boulevard. It is outside the WPAFB security fence and accessible to the public. Development at maximum buildout would consist of 4 new buildings totaling approximately 160,000 gsf. Construction would begin at the west end of the parcel and work its way to the east in phases as tenant demand for R&D office space dictates. Site work and construction of Building 5 would commence in 2031 and be completed in 2032. Building 8 design and construction are projected to occur in 2032 and 2033, with the remaining two buildings continuing in phases based on market demand, potentially through 2035. Utility connections would be made from existing utility services in or along Mission Point Boulevard and/or Colonel Glenn Highway. Site access would be from the existing signalized entrance off Colonel Glenn Highway to Mission Point Road.

No Action Alternative (EA §2.4.2, page 2-6): Under the No Action Alternative, the DAF would not enter into an EUL with a private developer for development of the Hilltop Parcel and Gerlaugh Farm Parcel and would not optimize use of these assets as described in EO13327. Instead, these two parcels would continue to remain open, undeveloped space. The No Action Alternative provides a baseline against which environmental impacts of the Proposed Action are compared.

ENVIRONMENTAL CONSEQUENCES

Based on the findings within the EA, it was determined implementation of the Proposed Action would have no effect on airspace management (EA §3.0, page 3-2). The proposed EUL projects would not result in any obstruction and/or hazards to existing airspace, so it was not evaluated further in the EA. The following resources were carried forward in the EA.

Noise (EA §3.3, pages 3-5 to 3-11): Both the proposed Hilltop EUL Parcel and the proposed Gerlaugh Farm EUL Parcel are located within the existing 65 decibels (dB) to 70 dB WPAFB Area A Air Installations Compatible Use Zones noise contour. Most office, restaurant and retail uses proposed for the EUL parcels should be suitable for location in this noise environment. The proposed hotel use would be slightly above the level recommended for hotels and require incorporation of noise reduction measures in the hotel construction materials to provide a suitable sleep environment.

Limited temporary impacts on the noise environment would result from construction activities near receptors adjacent to each site. Impacts would be limited to working hours from 7:00 AM to 7:00 PM.

During facility operations, there would be limited impacts from increased traffic noise concentrated during morning and evening rush hours to receptors along National Road at Hilltop and at residences west of Gerlaugh Farm. Children are present during the workday at the Wright Field Child Development Center approximately 225 feet west of the proposed Hilltop EUL parcel. The effects would be insignificant because building materials would attenuate noise levels while children are inside the facilities. The outdoor play area and playground equipment are located in back of the childcare facility, which is on the opposite side of the the Hilltop parcel. Impacts from subsequent operation and increased traffic at Gerlaugh would be insignificant at residences west of Gerlaugh Farm.

The No Action alternative would have no impacts because there would be no change in noise sources over baseline conditions.

The proposed Human Performance Wing Laboratory (2027) and AFIT Research Laboratory (2026 – 2030) are close enough to the Hilltop EUL site that concurrent construction activities could contribute to the noise environment of the Wright Field Child Development Center, and potentially at residences across National Road. WPAFB would subjectively monitor local construction noise in these areas and investigate any noise complaints received. Construction activities would be curtailed or mitigated in response if needed. Operational noise impacts from proposed EUL development would generally be expected to be limited to peak traffic times.

Land Use (EA §3.4, pages 3-11 to 3-16): Land use at the Hilltop parcel would change from recreational to industrial/commercial and be documented in WPAFB's Land Use Control Implementation Plan. While there would be an insignificant loss of recreational space, relocating the security fence would allow the proposed mixed-use development to be compatible with other nearby WPAFB land use. Under the WPAFB AICUZ, both proposed EUL parcels are subject to structure height restrictions associated with aircraft operations and, at the Hilltop site, the presence of radar systems. Buildings would be designed to comply with height restrictions, which would be 90 feet (ft) for the Hilltop parcel and 50 ft for the Gerlaugh parcel. Both parcels are generally compatible with adjacent land use and zoning classifications of the city of Beavercreek, Bath Township, and the city of Fairborn.

Construction of the EUL facilities at the Hilltop parcel and the Gerlaugh Farm parcel would result in a change from green space to impervious surface. Compared with the 2,000 acres of undeveloped land within the base, the 23.5 acres of converted land to impervious surfaces results in 1.2% reduction, which would not be a significant impact to overall green space.Under the No Action Alternative, new building construction would not occur on the proposed EUL parcels and the existing land use would remain the same.

Air Quality (EA §3.5, pages 3-16 to 3-23): The U.S. Environmental Protection Agency (EPA) has classified the metropolitan Dayton region as an Orphan Maintenance Area for the 1997 Ozone National Ambient Air Quality Standards and in attainment for all other criteria air pollutants. Minor, short-term construction-related emissions from particulate matter and engine exhaust would occur during construction and operation under the Proposed Action. The Air Conformity Applicability Model was used to evaluate impacts to air quality. The results indicated that emissions from construction and operation of the proposed EUL sites would not exceed any Clean Air Act General Conformity de minimis threshold or any DAF established insignificance indicators for criteria pollutants or greenhouse gases (EA Table 3-3).

The No Action alternative would have no impacts because there would be no change in air emissions over baseline conditions. Concurrent construction activities from these projects may contribute incrementally to impacts to local air quality, however no significant cumulative impacts to air quality are anticipated. The developer will utilize a fugitive emissions plan to control dust emissions and the construction activities would be monitored by base personnel.

Cultural Resources (EA §3.6, pages 3-23 to 3-27): No archaeological sites or National Register of Historic Places (NRHP) eligible buildings are located in close proximity to the proposed EUL sites. The Ohio State Historic Preservation Office responded in a letter dated January 3, 2024 (EA Appendix A) and concurred the proposed action would have no adverse effect on historic properties. Federally recognized Native American tribes typically only request notification when an action involves ground disturbance near a previously identified WPAFB cultural resources site or when construction on-Base involves areas of previously undisturbed ground. WPAFB has an Installation Tribal Relations Plan in place and federally recognized tribes are provided an opportunity to suggest any changes at the annual WPAFB teleconference, the last one held November 28, 2023. There has been no change in their preference for consultation. As the proposed EUL development project areas are considered to be located in an area of previous ground disturbance, consultation with the Native American tribes was not conducted. In the event of an unanticipated discovery of possible grave sites or other archaeological resources, actions detailed in the WPAFB Integrated Cultural Resources Management Plan would be initiated and work would be stopped immediately. The developer will notify the WPAFB Cultural Resources Manager on the nature and location of the discovery. The No Action alternative would have no impacts because there would be no ground disturbance and no NRHP-eligigle buildings are present. There would be no cumulative impacts to cultural resources attributable to these projects.

Biological Resources (EA §3.7, pages 3-27 to 3-32): The proposed EUL would result in a 1.2 percent reduction of existing vegetation across the base, which would be an insignificant impact. Disturbed areas on the proposed EUL project sites would be re-vegetated. In accordance with WPAFB policy, the developer will replace any trees removed at either proposed EUL site at a 3-to-1 ratio. No known occurrences or habitat of threatened or endangered species have been identified on or near either proposed EUL site.

The U.S. Fish and Wildlife Service responded on December 13, 2023 stating they concurred with the DAF's determination that the project, as proposed, is not likely to adversely affect the federally endangered Indiana bat and the northern long-eared bat. This concurrence is based on WPAFB's commitment to cut all trees greater than or equal to 3 inches in diameter at breast height only between October 1 and March 31. The Ohio Department of Natural Resources (ODNR) responded on January 12, 2024 indicating the entire state is in the range of the Indiana bat, a state and federally-endangered species; the northern long-eared bat, a state and federally-endangered species; the little brown bat , a state endangered species; and the tricolored bat, a state endangered species. The ODNR also recommended tree cutting should occur from October 1 through March 31 conserving trees with loose, shaggy bark, and/or crevices, holes, or cavities, as well as trees with a diameter at breast height greater than or equal to 20 inches as much as possible. With WPAFB's commitment in place, the ODNR also concurred these projects were not likely to impact the state threatened and endangered species described in their letter (EA Appendix A). The developer will be responsible for adhering to tree removal in accordance with the Integrated Natural Resources Management Plan replacing the trees in accordance with the WPAFB Installation Facility Standard. Under the No Action alternative, there would be no impacts because the existing biological resources would not change over baseline conditions. There

would be no significant cumulative impacts to biological resources because construction and/or renovation projects are located within previously-developed and/or disturbed areas.

Earth Resources (EA §3.8, pages 3-32 to 3-35): Both the Hilltop Parcel and the Gerlaugh Farm Parcel would require extensive site preparation and excavation for building foundations, subsurface utilities, and parking. There would be no significant impacts as both EUL parcels are relatively flat with mild slopes that would be addressed with routine engineering and construction techniques to maintain stability and prevent erosion. Disturbed areas will be restored with vegetative cover once construction is complete. The U.S. Department of Agriculture Natural Resources Conservation Service was contacted as the Gerlaugh Farm parcel identified soils classified as prime farmland if drained or farmland of local importance. The agency responded on July 10, 2024 and concurred the proposed conversion at the Gerlaugh Farm parcel is not subject to the provisions of the Farmland Protection Policy Act.

The No Action alternative would have no impacts since there is no change in existing soils over baseline conditions.

Cumulative impacts from construction activities associated with the Proposed Action and other related military construction and demolition projects will result in temporary disturbed ground surfaces and short-term adverse impacts on earth resources. Although soils would be disturbed by earthmoving and other construction activities, these efforts would not result in significant impacts on earth resources because best management practices (BMPs), erosion, and sediment controls and other management measures would be implemented; disturbed areas that are not paved would be restored with vegetative cover once construction is complete; and the cumulative increases in impervious surfaces would be minor in relation to areas restored with vegetative cover and remaining unpaved areas in the vicinity of the proposed EUL sites.

Water Resources (EA §3.9, pages 3-36 to 3-45): Construction and operation of new mixed-use and office developments on the proposed EUL parcels would not result in new groundwater withdrawals, so groundwater is not affected. No wetlands or floodplains are present. The Miami Conservancy District (MCD) concurred on December 5, 2023 that the proposed projects are outside of the Huffman Storage Basin and not subject to MCD restrictions. There would be no impacts to the retarding basin (EA Appendix A). Earth disturbance will exceed 1.0 acre and require the developer to prepare a construction stormwater pollution prevention plan (SWPPP) as well as obtain coverage under the Ohio Environmental Protection Agency (Ohio EPA) Construction General Permit (CGP). The SWPPP would detail site-specific erosion prevention and sediment control measures and BMPs to be implemented (such as erosion control fence, inlet sediment filter protection, sediment basins, etc.) that should prevent significant impacts to storm water quality during construction. The developer and their subcontractors would be responsible for obtaining all water permits and provide copies to WPAFB.

At full buildout, the proposed EUL development would result in conversion of approximately 15.8 of the total 22.0-acre site from pervious to impervious surface at the Hilltop Parcel and would result in conversion of approximately 7.7 of the total 21.9-acre site from pervious to impervious surface at the Gerlaugh Farm parcel. To comply with the Energy Independence and Security Act, Ohio EPA and the city of Beavercreek require construction of new storm water retention/detention basins to maintain pre-development hydrology and provide suspended solids and oil and grease removal from the new facilities. Since the proposed development will be constructed in phases, the new storm water drainage and management facilities construction will also be phased accordingly.

The Gerlaugh Farm site contains a perennial stream that conveys storm water drainage from the eastern portion of the site to the north side of Colonel Glenn Highway. A preliminary jurisdictional determination (PJD) was received from the U.S. Army Corps of Engineers (USACE) on April 26, 2024, which determined one non-wetland perennial stream is located within the PJD review area on the 22-acre site. The developer will be responsible for any necessary permits from the USACE under the Clean Water Act Section 404. Based on the proposed schedule, construction at Gerlaugh Farm would start in approximately 2031 with the buildings closest to this stream scheduled in approximately 2033 and 2034. The No Action alternative would have no impacts because there would be no change to water resources over baseline conditions. Construction activities associated with the proposed action and cumulative actions related to the AFIT Research Laboratory and Advanced Materials Research Laboratory are in the same general area of the Hilltop parcel in Area B. These projects would have short-term, minor, impacts on groundwater and surface water resources due to potential runoff from construction sites. For each site, impacts from runoff are minimized by using BMPs. Once completed, cumulative increases in impervious surfaces from these projects would be considered a minor contribution in the context of the whole watershed. Overall there will be no significant impacts to water quality with issuance of required federal and state water permits.

Infrastructure (EA §3.10, pages 3-45 to 3-53): Temporary impacts would occur during site preparation due to relocating or closing, capping, and abandoning in place existing utilities, particularly at the Hilltop EUL Parcel. All preliminary utilities disposition work would occur in areas that have been previously disturbed. The facilities at both EUL developments would use public utilities, which have sufficient capacity for growth. The developer would contact the local providers when design details are available. Traffic studies were conducted to evaluate potential impacts resulting from additional traffic generated from each proposed EUL development (EA Appendix D). Each study was developed in accordance with a Memorandum of Understanding established with the Greene County Engineer's Office. Site access design features (dedicated turn lanes and signal) identified as a result of traffic studies approved by Greene County would limit traffic impacts to maintain existing levels of service (LOS). The developer will incorporate a signal modification at the National Road and Kauffman Road intersection in order to mitigate traffic impacts from the proposed EUL development. Other measures to alleviate existing traffic conditions on National Road would require a regional effort to alleviate. The Greene County Traffic Engineer provided approval letters dated August 28, 2024 for the Hilltop parcel and September 5, 2024 for the Gerlaugh Farm parcel.

The No Action alternative would have no impacts to infrastructure/utilities or traffic over baseline conditions. Several proposed projects in the eastern portion of Area B would be conducted concurrently with the proposed EUL construction at the Hilltop parcel. There would be no cumulative impacts on utilities at WPAFB because the developer will obtain services directly from the local utility providers. Traffic studies have identified the need for regional improvements necessary to address existing deficiencies in the National Road network and restore LOS levels. Contributions of traffic increases from the cumulative projects would need to be mitigated in the design of these regional future improvements. These improvements require a regional effort between WPAFB, Greene County, and Ohio Department of Transporation (ODOT).

Hazardous Materials/Waste (EA §3.11, pages 3-53 to 3-64): The Proposed Action would have negligible impacts because hazardous materials used and hazardous waste generated during construction activities would be consistent in types and quantities typical of other WPAFB construction projects. Any hazardous, toxic, recyclable, and otherwise regulated waste streams generated by DAF tenant

operations would be managed through the 88th Civil Engineer Group Environmental Branch in accordance with the WPAFB Hazardous Waste Management Plan. No adverse impact to Insallation Restoration Program (IRP) sites would occur because a soil management plan would be prepared to establish project-specific procedures for handling and disposal of soil on and in the vicinity of Earth Fill Disposal Zone (EFDZ) 5 at the Hilltop site. Based on correspondence from the Ohio EPA dated February, 15 2024 and from USEPA dated April 26, 2024 (EA Appendix A), WPAFB will implement the following:

- The allowable land use will change from recreational to industrial/commercial. The current Land Use Control Implementation Plan (LUCIP) has been annotated stating for EFDZ 5, current land use is recreational and upon the property becoming an EUL, the land use will change from recreational to industrial/commercial. Once the EUL lease has been finalized and signed, WPAFB will annotate the LUCIP to indicate the land use change has been implemented.

- Vapor intrusion mitigation measures will be incorporated into the design of the buildings to be constructed within the boundaries of EFDZ 5 on the Hilltop parcel. These measures will be the responsibility of the developer.

- Any excess soil to be removed off-base will be sampled and profiled. Sampling will include per- and polyfluorinated alkyl substances. These measures will be the responsibility of the developer.

Construction or earth disturbance in or within 300 feet of a landfill will require submittal and approval of a Rule 513 Application by Ohio EPA prior to construction. For future construction on the Hilltop parcel impacting the EFDZ, WPAFB will submit a Rule 513 Application to Ohio EPA.

There are no IRP sites identified at the Gerlaugh Farm parcel. The No Action alternative would have no impacts because there is no usage, generation, storage, or disposal of hazardous materials/waste at the proposed sites. As there would be no soil-disturbing activities, there would be no changes to IRP sites. The No Action alternative would have no change in hazardous materials/waste over baseline conditions. Cumulative effects from the Proposed Action when added to other projects would not impact the Base's hazardous waste management program since all hazardous materials and wastes would be managed in accordance with applicable Base, Ohio, and federal regulations. Considering the number of other past, present, or future foreseeable projects at WPAFB over the next 10 years, the incremental effects of construction debris from the proposed action on local landfills would be expected to be insignificant as there is existing capacity available and recycling of material will be implemented.

Safety and Health (EA §3.12, pages 3-64 to 3-69): Implementation of the Proposed Action would have no significant direct, indirect, and/or cumulative impacts to safety. Construction workers would adhere to all federal, state, and local safety regulations and standards. Construction of the relocated WPAFB security fence would be completed before removal of the existing fence at the Hilltop site to ensure anti-terrorism force protection. The No Action alternative would have no impacts because there would be no changes in baseline conditions.

Socioeconomics (EA §3.13, pages 3-69 to 3-72): The Proposed Action would have beneficial impacts on local workforce and economy from revenue generated by construction activities as well as the creation of approximately 2,000 skilled jobs. Changes in local services (such as fire, law enforcement, and medical), property values, school enrollment, and county and municipal expenditures would be

expected to be insignificant. The No Action alternative would have no impacts because there would be no change in baseline conditions.

Regarding cumulative effects, the Proposed Action would incrementally contribute to the overall beneficial impacts on the local workforce from the construction projects planned at WPAFB as well as in the surrounding community.

Environmental Justice (EA §3.14, pages 3-72 to 3-80): Census Tract 2001.04, directly across National Road from the Hilltop site, exhibits elevated environmental justice characteristics and would be potentially affected by construction and operation of the proposed EUL development. These potential impacts could contribute to existing environmental justice indicators of concern but these impacts would be incremental and lack the intensity to be considered significant. The No Action alternative would have no impacts because there would be no change in baseline conditions. Cumulative effects would result if any other concurrent proposed projects would impact the same census track near the Hilltop EUL Parcel, and 911 or 908 near the Gerlaugh Farm EUL Parcel. Cumulative environmental justice impacts to traffic and associated air quality, noise and safety – primarily to Census Tract 2001.04 across National Road from the proposed Hilltop EUL development – could occur from concurrent construction traffic entering and exiting Gate 19B at National Road from other planned/programmed WPAFB Area B projects. The intensity of these impacts would depend on specific project construction periods and even short-term delivery schedules of construction equipment and supplies. WPAFB would need to mitigate these impacts by traffic impact mitigation measures. In addition, contributions of traffic increases from cumulative projects would need to be mitigated in the design of regional future improvements. These improvements require a regional effort between WPAFB, Greene County, and ODOT.

PUBLIC NOTICE

A public notice was posted in the *Dayton Daily News,* the *Fairborn Daily Herald*, and the WPAFB *Skywrighter* initiating a 30-day public comment period (EA Appendix A) from October 2, 2024 through November 1, 2024. In addition, the Draft EA and Draft FONSI were posted by 88 ABW Public Affairs on the WPAFB public website and Facebook page and were made available in the Greene County Public Library, Fairborn Branch. During this time, [#] public comments were received.

MITIGATION AND MONITORING

As the proponent for this action, the 88 ABW is responsible for ensuring mitigations, BMP, and permits are fully funded, in place, and being carried out as identified above and referenced in the EA. A joint Mitigation and Monitoring Plan (MMP) will be prepared by the proposed developer and DAF within 90-days subsequent to signature of this document and include regulatory permitting requirements as they become available along with an anticipated mitigation schedule and completion date(s). The proposed developer and its contractors will adhere to all applicable permitting and BMPs in accordance with federal, state, and/or local regulatory requirements during installation and operation of the Proposed Action. The MMP is a living document and as such will be updated throughout the life of the project. It is expected mitigation monitoring will generally consist of adherence to permit requirements and on-the-ground inspections. The proposed developer and DAF will evaluate the effectiveness of these monitoring methods and revise as necessary to address deficiencies discovered during these inspections.

FINDING OF NO SIGNIFICANT IMPACT

Based on review of the facts and analysis summarized above and contained within the EA, I conclude that entering into an EUL with a private developer to construct and use new commercial facilities as

proposed will not have a significant impact on the human environment, including the natural environment. An environmental impact statement is not required for this action. By entering into a mixed-use EUL with the developer to construct research campus-like setting, this allows the DAF to optimize the value of real property assessts per 10 USC Section 2667 promoting national defense and supporting public interest. This fulfills the analysis requirements of NEPA, the President's Council on Environmental Quality regulations 40 CFR Parts 1500 – 1508, and DAF regulations 32 CFR Part 989, the DAF environmental impact analysis process.

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Environmental Assessment
Draft

Environmental Assessment
Enhanced Use Lease
Wright-Patterson Air Force Base, Ohio

Prepared for:
88th Air Base Wing (88 ABW)
Wright-Patterson Air Force Base, Ohio

September 2024

Environmental Assessment for Enhanced Use Lease
Wright-Patterson Air Force Base, Ohio

PRIVACY ADVISORY

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

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

Public commenting allows the DAF 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 EA.

COMPLIANCE

This document has been certified that it does not exceed 75 pages, not including appendices, as defined in 40 CFR § 1501.5(f). In accordance with 40 CFR § 1508.1(v), a "page" means 500 words and does not include maps, diagrams, graphs, tables, and other means of graphically displaying quantitative or geospatial information.

ACCESSIBILITY NOTICE

This document is compliant with Section 508 of the Rehabilitation Act. This allows assistive technology to be used to obtain the available information from the document. Due to the nature of graphics, figures, tables, and images occurring in the document, accessibility is limited to a descriptive title for each item.

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Acronyms and Abbreviations

°F	Degrees Fahrenheit
>	Greater Than
88 ABW	88th Air Base Wing
ACAM	Air Conformity Applicability Model
ACM	Asbestos-Containing Material
ACS	American Community Survey
AF	Air Force
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	Aqueous Film Forming Foam
AFH	Air Force Handbook
AFI	Air Force Instruction
AFIT	Air Force Institute of Technology
AFMAN	Air Force Manual
AFRL	Air Force Research Laboratory
AICUZ	Air Installations Compatible Use Zones
AIM	Architectural and Industrial Maintenance
AMRL	Advanced Materials Research Laboratory
APE	Area of Potential Effect
APTIM	Aptim Federal Services, LLC
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
AST	Above-ground Storage Tank
ATFP	Anti-Terrorism/Force Protection
ATSDR	Agency for Toxic Substances and Disease Registry
BHE	BHE Environmental, Inc.
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
BVAS	Buried Valley Aquifer System
c&dd	Construction & Demolition Debris
C2A	Consolidate to Accelerate
CAA	Clean Air Act
CDC	Centers for Disease Control
CEG	Civil Engineer Group
CEIE	Environmental Branch, Installation Management Division
CEIEA	Environmental Assets Section of the Environmental Branch in the Installation Management Division
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CGPA	Colonel Glenn Planning Area
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
CWA	Clean Water Act

Acronyms and Abbreviations (continued)

CZ	Clear Zone
CZOM	Air Force Civil Engineer Center Environmental Restoration Section, Operations Division, Midwest Branch under the Environmental Directorate
DAF	Department of the Air Force
dB	Decibel
dBA	A-weighted Sound Level Measurement
DMWM	Division of Materials and Waste Management
DNL	Day-night A-weighted Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ECP	Entry Control Point
EFDZ	Earth Fill Disposal Zone
EIAP	Environmental Impact Analysis Process
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EJI	Environmental Justice Index
EJIOC	Environmental Justice Indicators of Concern
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
ESZ	Explosive Safety Zone
EUL	Enhanced Use Lease
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FRP	Facility Response Plan
GCR	General Conformity Regulations
GHG	Greenhouse Gas
gsf	Gross Square Feet
GWOU	Groundwater Operable Unit
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating Ventilation and Air-conditioning
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
IT	Information Technology
ITRP	Installation Tribal Relations Plan
LAeq	A-weighted, equivalent sound pressure level
LBP	Lead-based Paint
LOS	Level of Service
LUCIP	Land Use Control Implementation Plan
MA	Metropolitan Area
MCD	Miami Conservancy District

MILCON	Military Construction
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NLR	Noise Level Reduction
NO2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen Oxides
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O3	Ozone
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
OU	Operable Unit
PCB	Polychlorinated Biphenyl
PFAS	Per-and Polyfluorinated Alkyl Substances
PJD	Preliminary Jurisdictional Determination
PM10	Particulate Matter with an Aerodynamic Particle Size Less Than or Equal To 10 Micrometers
PM2.5	Particulate Matter with an Aerodynamic Particle Size Less Than or Equal To 2.5 Micrometers
ppm	parts per million
R&D	Research and Development
RACM	Reasonably Available Control Measure
RCRA	Resource Conservation and Recovery Act
RFLP	Request for Lease Proposal
ROD	Record of Decision
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO2	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
tpy	tons per year
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank

Acronyms and Abbreviations (continued)

VOC	Volatile Organic Compound
WPAFB	Wright-Patterson Air Force Base

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

This chapter describes the purpose and need for the proposed action and provides additional introductory and background information,

1.1 Introduction and Background

This Environmental Assessment (EA) has been prepared for the Department of the Air Force (DAF) to analyze potential environmental impacts of a proposed project at Wright-Patterson Air Force Base (WPAFB) in Dayton, Ohio (Figure 1-1). The 88th Air Base Wing (88 ABW) proposes to enter into an Enhanced Use Lease (EUL) agreement for future development of two parcels of WPAFB property. The proposed EUL is expected to enhance the value of those unused parcels to complement existing and future DAF, Space Force, and other WPAFB tenant operations.

WPAFB is one of the largest, most diverse, and most organizationally complex installations in the DAF. It provides vital support to ensure the DAF and joint warfighters have the modernized systems they need. The host command is the 88 ABW, which is responsible for services to over 100 tenant units currently housed at WPAFB representing a variety of critical Department of Defense (DoD) acquisition, research, and sustainment activities. In addition, WPAFB is a critical center for research, development, testing, evaluation, and provision of acquisition management services and logistic support necessary to keep DAF systems ready for war.

Executive Order (EO) 13327, *Federal Real Property Asset Management* (February 4, 2004), establishes "It is the policy of the United States to promote the efficient and economical use of America's real property assets and to assure management accountability for implementing Federal real property management reforms." The February 14, 2007, DAF memorandum titled *Pursuing "Value-Based" Transactions Involving Air Force Real Property Assets* defines organizational responsibilities for DAF entities to optimize the value of real property assets using authorized tools such as the EUL program.

The EUL program allows the DoD and its branches and agencies to, under the authority of 10 United States Code (USC) 2667 (the "Enabling Statute"), lease real property under its control that is not needed for public use and is not excess property, and that would meet the specified lease conditions in the statute. This mechanism then allows a private party to use proceeds resulting from development on the leased property to support a goal stipulated by the DoD. Requirements, authorities, and procedures for DAF real property transactions are established in Air Force Instruction (AFI) 32-9002, *Management of Real Property*, and AFI 32-9003, *Granting Temporary Use of Air Force Real Property*.

WPAFB conducted solicitations from February 12 through April 26, 2021 on SAM.gov.

The request for lease proposal (RFLP) is the formal solicitation for proposals to develop an asset optimization opportunity at WPAFB using EUL processes and the Enabling Statute. The RFLP set forth specific EUL *objectives* for selecting a Potential Lessee that will:

- Lease and optimize the use of the Property in accordance with the Enabling Statute and within the constraints and restrictions documented in the RFLP
- Optimize the consideration to be received by the Government in cash or in-kind in exchange for granting a leasehold interest in the Property
- Lease and use the Property in a manner that minimizes risk to the Government
- Lease and use the Property in a manner that is compatible with the Government mission and adjacent Government uses
- Lease and use the Property in a manner that minimizes environmental and cultural impacts
- Lease and use the Property consistent with best commercial practices
- Lease and use the Property in a manner that supports positive relations with local Governmental authorities and the communities adjacent to the Property.

This EA evaluates the potential environmental impacts of activities associated with the proposed EUL development in accordance with the National Environmental Policy Act (NEPA) (42 USC 4321, et seq.). NEPA requires federal agencies to consider environmental consequences in their decision-making process.

The objectives of this EA are as follows:

- Provide sufficient evidence and analysis for determining whether to prepare a Finding of No Significant Impact (FONSI).
- Aid in DAF compliance with NEPA when an Environmental Impact Statement (EIS) is not necessary and facilitate preparation of an EIS when necessary.

1.2 Location

WPAFB is located in the southwestern portion of the state of Ohio in Greene and Montgomery Counties, approximately 10 miles east of the city of Dayton (Figure 1-1). The base encompasses 8,145 acres and is subdivided into two areas: Areas A and B. Area A is primarily administrative offices and an active airfield. Area B is primarily research and development (R&D) with educational functions and is located across State Route 444 to the southwest. The proposed EUL

project sites are located on the perimeter of existing WPAFB Area B property as shown in Figure 1-2.

1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to promote the efficient and economical use of real property assets at WPAFB pursuant to the directives of EO 13327, *Federal Real Property Asset Management.* In seeking development of this property, WPAFB is also pursuing objectives outlined in the 14 February 2007, DAF memorandum titled: *Pursuing "Value-Based" Transactions Involving Air Force Real Property Assets*. This memorandum directs the DAF to optimize the value of real property assets using authorized tools such as the EUL program. DoD leasing tools such as 10 USC Section 2667, *Leases: Non-Excess Property of Military Departments and Defense Agencies*, allow the DAF, through its EUL program, to lease non-excess real property for terms that promote the national defense or are in the public interest.

Located in the southwestern corner of Ohio, WPAFB has longstanding relationships with academic institutions and industry partners in support of creating leading-edge research, development, and delivery of war-winning weapons systems in the air and space domains. The installation is situated within proximity to several universities (e.g., Air Force Institute of Technology (AFIT), Wright State University, University of Dayton, Sinclair Community College, etc.) as well as innovation centers (Air Force Research Laboratories, National Air and Space Intelligence Center, National Space Intelligence Center). As such, there is a demand from defense contractors to have administrative offices, R&D laboratories/facilities, and other development space within close proximity to the base.

The need for the action is to create additional value of underutilized WPAFB land through the potential development of commercial facilities, infrastructure and assets enhancing existing and future WPAFB level research and development, science and technology, and education operations. The proximity of the proposed EUL parcels would provide opportunity for public or private contractors and partners to locate future operations close to their WPAFB counterparts to increase collaboration across acquisition (procurement/logistics), technology development and academics. Potential inclusion of supporting commercial establishments – such as short-term lodging (hotels), food service, and financial services – would further support "quality of life" amenities currently in limited supply on the WPAFB installation and for future EUL tenants. In leasing the land to a private EUL developer, the DAF is meeting its strategic goal of optimizing the value of its existing lands.

For this action, a mixed-use lease focusing on a research campus-like setting is the most appropriate type of EUL action to undertake versus an EUL action involving renewable energy (i.e., solar/wind energy), waste reclamation, or solely involving either administrative office space and/or hospitality (i.e., hotel). There is a need to create a collaborative space for discovery,

invention, and exchange of ideas by the DAF with its partners and the surrounding communities. Besides benefiting contractors focused on R&D/educational work, this space may also be used to house additional amenities such as retail, restaurants, and other hospitality services supporting both WPAFB and the local community at large.

1.4 Scope of Environmental Analysis

The focus of this EA is on construction and use of commercial EUL development on two WPAFB parcels, as shown on Figure 1-2. A detailed description of the proposed project is presented with the project description in Section 2.4.

For each element of the Proposed Action and Alternatives carried forward, the analysis presented in the EA will describe the existing environmental resources in the vicinity of or potentially impacted by the project, and then evaluate the potential impacts to and associated mitigation for each environmental resource area. These resources include:

- Airspace Management
- Noise
- Land Use
- Air Quality
- Cultural Resources
- Biological and Natural Resources
- Water Resources
- Earth Resources
- Infrastructure
- Hazardous Materials and Waste
- Safety and Occupational Health
- Socioeconomics
- Environmental Justice

1.5 Documents Incorporated by Reference

This EA is primarily based on information from the following documents:

- RFLP No. AFCEC-21-R-0003, Enhanced Use Leasing Project Wright-Patterson Air Force Base, 12 February 2021

- Environmental Baseline Survey, Gerlaugh Farm, Wright-Patterson AFB, Dayton, OH, 16 July 2021
- Environmental Baseline Survey, Hilltop Campus, Wright-Patterson AFB, Dayton, OH, 16 July 2021
- EO 13327, Federal Real Property Asset Management, 4 February 2004
- 10 USC 2667 Leases: non-excess property of military departments and Defense Agencies

Resource-specific documents will also be referenced in Section 3.0, Affected Environment and Environmental Consequences, as applicable to each environmental resource.

1.6 Relevant Laws and Regulations

NEPA (42 USC 4321 et seq.) is a federal law requiring the analysis of potential environmental impacts associated with proposed federal actions prior to taking them. The intent of NEPA is to make informed decisions based on the identification of potential environmental consequences and take appropriate actions to protect, restore, or enhance the environment. NEPA established the President's Council on Environmental Quality (CEQ), which is responsible for ensuring federal agency compliance with NEPA as outlined in 40 Code of Federal Regulations (CFR) 1500-1508, *National Environmental Policy Act Implementing Regulations*. CEQ mandated all federal agencies use a prescribed approach to NEPA. To meet this mandate, DAF codified its NEPA procedure at 32 CFR 989, *Environmental Impact Analysis Process (EIAP)*.

Air Force Policy Directive 32-70, *Environmental Considerations in Air Force Programs and Activities*, states the DAF will comply with applicable federal, state, and local environmental laws and regulations, including NEPA. If significant impacts are expected under NEPA, the DAF would decide whether to conduct mitigation to reduce impacts below the level of significance, prepare an EIS, or abandon the Proposed Action. The EA will be used to guide the DAF in implementing the Proposed Action in a manner consistent with DAF standards for environmental stewardship should the Proposed Action be approved.

1.7 Intergovernmental Coordination, Public and Agency Participation

The NEPA requirements help ensure environmental information is made available to the public during the decision-making process and prior to an action's implementation. Pursuant to 40 CFR 1501.5(f), "Agencies shall involve the public, State, Tribal, and local governments, relevant agencies, and any applicants, to the extent practicable in preparing environmental assessments." For this EA, public involvement includes notifying local, state, and federal agencies and the public about the proposed action and alternatives; soliciting agency and public comments on the EA analysis; and ultimately informing the public of DAF conclusions and findings.

1.7.1 Interagency and Intergovernmental Coordination and Consultations

In compliance with NEPA and applicable regulations for this EA, WPAFB notified relevant stakeholders about the Proposed Action. Interagency and intergovernmental coordination and consultation were conducted with the following agencies: the Miami Conservancy District (MCD), the Ohio Environmental Protection Agency (Ohio EPA), the Ohio Department of Natural Resources (ODNR), the U.S. Fish and Wildlife Service (USFWS), the State Historic Preservation Office (SHPO), U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (USEPA), U.S. Department of Agriculture (USDA), city of Beavercreek, and Greene County. The notification process provided these stakeholders with the opportunity to cooperate with WPAFB and to provide comments regarding the Proposed Action. Coordination with these agencies is presented in Appendix A of the EA.

1.7.2 Government-to-Government Relations

EO 13175, *Consultation and Coordination with Indian Tribal Governments*, recognizes the right of federally recognized Indian tribes to self-government and supports tribal sovereignty and self-determination. Among other things, it requires agencies have an accountable process to ensure meaningful and timely input by tribal officials in developing policies that have tribal implications. In November 2009, President Obama reaffirmed the government-to-government relationship between the federal government and Indian tribal governments in a White House memorandum acknowledging that federally recognized Indian tribes exercise inherent sovereign powers over their members and territory. The process for tribal communications at WPAFB is outlined in the *Installation Tribal Relations Plan* (ITRP; WPAFB, 2017) and is further discussed in Section 3.5.1.

1.7.3 Public and Agency Review of the EA

A Notice of Availability (NOA) for the Draft EA and Draft FONSI will be published in each of three newspapers, the *Dayton Daily News,* the *Fairborn Daily Herald,* and the WPAFB *Skywrighter,* initiating a 30-day public review period. In addition, the Draft EA and Draft FONSI will be posted by 88 ABW Public Affairs on the WPAFB public website and Facebook page. The Draft EA and Draft FONSI will be made available in the Greene County Public Library, Fairborn Branch. During this time, public comments will be received. Copies of the NOA will be included in Appendix A of the EA.

Section 508 of the Rehabilitation Act (29 USC 794d) requires federal agencies to develop, procure, maintain, and use information and communications technology that is accessible to people with disabilities, regardless of whether they work for the federal government. The US Access Board established the Section 508 standards that implement the law and provides the requirements for accessibility. Section 508 requires federal agencies to make their information and communications technology, online training, and websites accessible for everyone.

Electronic versions of this document will be compliant with Section 508 of the Rehabilitation Act. This allows assistive technology to be used to obtain the available information from the document. Due to the nature of graphics, figures, tables, and images occurring in the document, accessibility will be limited to the descriptive title for each item.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the selection standards and provides the details of the proposed action and alternatives.

2.1 Proposed Action

88 ABW is proposing to enter into an EUL with a private developer to construct and use new commercial facilities at the Hilltop Parcel and the Gerlaugh Farm Parcel on and near WPAFB Area B as shown in Figure 1-2. The development on both sites would consist primarily of phased construction and use of office buildings, and may include a limited amount of retail, restaurant, and hotel space on the Hilltop Parcel. Both proposed sites are currently unoccupied, and the proposed new construction and use would not conflict with other WPAFB missions or operations.

The existing 22-acre Hilltop Parcel is primarily maintained open space with walking trails east of the AFIT and west of National Road. To create direct public access along National Road, the fence line surrounding the Parcel would be reconfigured to the north, west, and south and a pedestrian gate added for base personnel. Light commercial and residential properties are located to the east of the Hilltop Parcel across National Road, with additional Wright State University residential and academic complexes further to the east.

The existing 22-acre Gerlaugh Farm Parcel is also primarily maintained open space between the Mission Point Residential Development to the west and the I-675/Colonel Glenn Highway interchange. The Parcel is across from the Area B, south of the Colonel Glenn Highway, and is accessed and bisected by Mission Point Boulevard. The Gerlaugh Farm Parcel is accessible to the public. It is not behind the WPAFB security fence.

The new facilities would be constructed consistent with applicable federal, state, and local standards. Utility services would be obtained directly from the respective service providers, with limited exceptions where existing infrastructure such as storm sewers are owned, maintained, and permitted by WPAFB. Neither EUL site is located within or partly within a 100-year floodplain.

2.2 Selection Standards

The DAF considered a range of alternatives for the Proposed Action. A reasonable alternative is defined in 32 CFR 989.8(b) as one that meets the underlying purpose and need for the proposed action and that would cause a reasonable person to inquire further before choosing a particular

course of action. Reasonable alternatives are not limited to those directly within the power of the DAF to implement and may involve another government agency or military service to assist in the project or even to become the lead agency.

In addition to standards and criteria associated with the proposed action's purpose and need, WPAFB master planning and environmental constraints must also be considered in the selection of reasonable alternatives. These constraints are man-made or natural elements or conditions that may create significant limitations on the operation or construction of buildings, roadways, utility systems, airfields, training ranges, and other facilities. When considered collectively with the installation's capacity opportunities, these constraints would identify areas open for development and those areas that can be redeveloped to support future growth or mission expansion. Planning constraints include operational, natural/environmental, and built features.

Prior to issuing the EUL RFLP to prospective bidders, the DAF evaluated alternate WPAFB EUL sites using the following selection standards:

- 10 USC 2667 Compliant Property – To be carried forward as a viable site for analysis, a mixed-use site must be under the exclusive control of the Secretary of the DAF and must not be needed for public use. In addition, the property cannot be excess property, as defined by 40 USC 102.
- Land Availability – The site must comprise at least 20 acres of contiguous, non-excess DAF real property capable of supporting a mixed-use lease to meet the project's purpose and need, which includes optimizing the value of DAF real property by leasing land through the EUL program. Smaller parcels generally would not support the economies of scale necessary for site development to be financially viable.
- Mission Compatibility – To be a viable alternative for analysis, the mixed-use must be compatible with flight testing and other military, governmental and commercial missions occurring on WPAFB.
- Force Protection Compatibility – The site must not compromise base operations or the ability to implement force protection measures and base security. A mixed-use site must be located on the perimeter of the installation or in other contained areas, where a developer and the base can monitor and validate the credentials of employees during the EUL development and operation.
- Site Accessibility – The site must be accessible for workers and equipment to support construction of facilities/structures in support of a mixed-use lease action. The site must be within a reasonable distance (e.g., approximately two miles) to access existing infrastructure (i.e., improved/paved roads, communications, power, electrical, water

systems, etc.) to ensure the development team can proceed with constructing and operating a research-like campus.

- Physical Compatibility – Topography and slope of the proposed site location must support the proposed project. Topography should consist of land that is generally flat and with a low sloping grade. The site must be located out of the 100-year floodplain in accordance with EO 11988, Floodplain Management.
- Compatible Land Use Settings for Noise – A site must be compatible with WPAFB's 2022 Air Installation Compatible Use Zones (AICUZ) Study (WPAFB, 2022a), which includes appropriate decibel noise level reductions due to WPAFB aircraft operations.

2.3 Screening of Alternatives

Reasonable alternatives were developed based on the proposed action's purpose and need (Section 1.3) and involved discussions with DAF stakeholders during the scoping of the EA. Initial sites for EULs are shown on Figure 2-1 and listed in Table 2-1 with the reason as to why or why not these sites were carried forward for further environmental analysis.

As shown in Table 2-1, the Proposed Action (Sites #8 and #10) met the selection standards. Therefore, the Proposed Action [Site #8 (Hilltop Parcel) and Site #10 (former Gerlaugh Farm)], and the No Action Alternative will be carried through the EA for full evaluation. Within the Proposed Action, several minor options exist – primarily whether the proposed hotel, restaurant, and retail components would be constructed on the proposed schedule or replaced/postponed with additional office building construction. Inclusion of these amenities would be based on forecast market-driven demand for those components prior to beginning their construction, as assessed by the EUL developer, with concurrence by the DAF. Evaluation of those alternatives will be included as options in evaluation of potentially affected resource areas of the Proposed Action in Section 3.0.

2.4 Detailed Description of the Alternatives

This section describes the alternatives carried forward for analysis in this EA.

2.4.1 Proposed Action

The Proposed Action is for DAF to execute an EUL with a private developer to construct and use new commercial office buildings, with a limited amount of retail, restaurant and hotel facilities at the Hilltop Parcel and the Gerlaugh Farm Parcel on WPAFB Area B as shown in Figure 1-2.

- The Hilltop Parcel
  - The Hilltop Parcel development at maximum buildout would consist of 7 new buildings totaling approximately 405,000 gross square feet (gsf). The parcel is

approximately 22.0 acres of which 15.8 acres would be disturbed to accommodate buildings and parking areas. Construction would begin at the south end of the parcel and work its way to the north in phases. A pedestrian plaza would be constructed between the buildings along the north-south spine of the development to promote pedestrian circulation and access to public amenities available in Buildings 1, 2, and 4. To create direct public access along National Road, the fence line surrounding the parcel would be reconfigured to the north, west, and south, and a pedestrian gate added for base personnel. Site preparation would also involve removing trees at this site. Following completion and approval of this EA and FONSI, and execution of the EUL, site work and construction of Building 1 would commence in 2025, followed by Building 2 in 2026. Construction of the remaining five buildings would continue in phases based on market demand, potentially through 2031. Table 2-2 details conceptual sizing characteristics of the proposed EUL development. Sizing of specific buildings may vary with market demand over time but represents the conceptual overall buildout.

  - Utility connections would generally be made from existing utility services in or along National Road. It is possible that emergency power generation would be required depending on building usage. Any on-site power generation would be permitted in accordance with applicable USEPA and state of Ohio requirements. Site access would be from at least two new entrances off National Road. The existing National Road design includes a center turning lane.

- The Gerlaugh Farm Parcel
  - The Gerlaugh Farm Parcel development at maximum buildout would consist of 4 new buildings totaling approximately 160,000 gsf. The parcel is 21.9 acres of which 7.7 acres would be disturbed to accommodate buildings and parking areas. Part of the construction would also begin at the west end of the parcel and work its way to the east in phases as tenant demand for R&D office space dictates. Following completion and approval of this EA and FONSI, and execution of the EUL lease, site work and construction of Building 5 would commence in 2031 and be completed in 2032. Building 8 design and construction are projected to occur in 2032 – 2033, with the remaining two buildings (Buildings 10 and 12) continuing in phases based on market demand, potentially through 2035. Table 2-3 details conceptual sizing characteristics of the proposed Gerlaugh Farm EUL development. Sizing of specific buildings may vary with market demand over time but represents the conceptual overall parcel buildout.
  - Utility connections would generally be made from existing utility services in or along Mission Point Boulevard and/or Colonel Glenn Highway. It is possible that

emergency power generation would be required depending on building usage. Any on-site power generation would be permitted in accordance with applicable USEPA and state of Ohio requirements. Site access would be from the existing signalized entrance off Colonel Glenn Highway to Mission Point Road. A traffic analysis of Colonel Glenn Highway and Mission Point Boulevard was completed to assess potential impacts of the EUL development at the Gerlaugh Farm parcel.

Building construction at both the Hilltop and Gerlaugh Farm Parcels would utilize a steel structural system on a reinforced concrete foundation with an exterior veneer consisting of masonry, aluminum composite material paneling, exterior insulation and finishing systems, and glazing. Building foundations would be slab-on-grade. There would be no excavation for basements.

Use of any special or unusual construction methods is not anticipated at this time. The buildings would utilize rooftop heating, ventilation, and air conditioning (HVAC) units with natural gas as the building's heat source. Each building would contain its own fire protection/suppression system providing audible and visual alarms with direct notification to local designated emergency response organizations. Intrusion detection systems would be included for all non-public buildings or areas within buildings. Specialized systems such as clean/conditioned utilities, vibration isolation or precision environmental (HVAC or humidity) controls may be supplied for specific tenants as needed. Stormwater would be detained/retained at each site to meet applicable federal, state, and local standards.

The Hilltop Parcel includes Earth Fill Disposal Zone (EFDZ) 5, which was evaluated as part of Remedial Investigation of Operable Unit 9 under WPAFB's Installation Restoration Program (IRP) in the mid-1990s. EFDZ 5 was determined to require no further remedial action based on potential future industrial land use in the Final Remedial Investigation Report issued in September 1997. As part of this project, WPAFB would implement the following items described in consultation letters from the Ohio EPA and USEPA (Section 3.9.3.1 and Appendix A):

- Allowable land use would be changed from recreational to industrial/commercial in the Land Use Control Implementation Plan.
- Vapor intrusion mitigation measures would be incorporated into the design of the buildings to be constructed within the boundaries of EFDZ 5 on the Hilltop Parcel.
- Any excess soil to be removed off-base would be sampled and profiled.

2.4.2 No Action Alternative

The NEPA and CEQ and DAF NEPA implementing regulations require inclusion of the No Action Alternative to assess environmental consequences that would occur if the Proposed Action is not implemented; therefore, this alternative is carried forward for detailed analysis in the EA. The No Action Alternative provides the baseline against which the Proposed Action will be assessed.

Under the No Action Alternative, the DAF would not enter into an EUL with a private developer for development of the Hilltop Parcel and Gerlaugh Farm Parcel and would not optimize use of these assets as described in EO 13327. Instead, these two parcels would continue to remain open, undeveloped space.

2.5 Alternatives Considered but Eliminated

As discussed in Section 2.3, WPAFB considered multiple alternative sites in both Area A and Area B. The Proposed Action sites, the Hilltop Parcel (Site #8) and the Gerlaugh Farm Parcel (Site #10), and the No Action Alternative met the selection standards outlined in Section 2.2. None of the other candidate sites met all of the selection standards outlined in Section 2.2; therefore, none of the other candidate sites will be carried forward for evaluation in Section 3.0 of the EA.

2.6 Comparison of Environmental Consequences

Table 2-4 presents a comparison of the potential environmental consequences resulting from implementation of the Proposed Action and the No Action Alternative. The information includes a concise definition of the issues addressed and the environmental impacts associated with each alternative. Short-term impacts primarily address site preparation and construction. Long-term impacts are associated with the operations. The analysis is based on information discussed in detail in Section 3.0, *Affected Environment and Environmental Consequences*, of the EA.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

In compliance with NEPA, CEQ regulations, and 32 CFR 989, this section describes the current environmental and socioeconomic conditions most likely to be affected by the Proposed Action and alternatives and provides a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action and alternatives. These resources and conditions include:

- Airspace Management
- Noise
- Land Use
- Air Quality
- Cultural Resources
- Biological/Natural Resources
- Water Resources
- Earth Resources
- Infrastructure
- Hazardous Materials/Waste
- Safety and Occupational Health
- Socioeconomics
- Environmental Justice

Analysis of these potential environmental effects focuses on resource areas that are appropriate for consideration in light of the proposed action. All resource areas were initially considered, but some were eliminated from detailed evaluation as described below because they were determined to have no relevance to the Proposed Action or no impact as a result of its implementation.

In addition, this section describes the potential environmental consequences associated with implementing the Proposed Action, alternatives or the No Action Alternative. Potential impacts for each resource area are described in terms of their significance. In considering whether an adverse effect of the proposed action is significant, agencies must examine both the context of the action and the intensity of the effect (as detailed in 40 CFR 1501.3(d)).

For each environmental resource, the evaluation begins by defining the affected environment – national, regional, or local – which for the proposed EUL development is restricted to the local environment. Evaluation of significance of potential impacts in the vicinity of each proposed site then considers:

- Short- and long-term effects
- Degree of beneficial and adverse impacts
- Direct, indirect and cumulative effects
- Past, present, and reasonably foreseeable impacts
- Short-term vs. long-term productivity
- Irreversible/irretrievable commitments of resources
- Effects on public health and safety
- Effects that violate federal, state, tribal, or local environmental law

3.1 Resources Eliminated from Detailed Analysis

The following resource was determined to have limited potential for environmental impacts as a result of implementation of the Proposed Action and, therefore, was eliminated from further evaluation.

3.1.1 Airspace Management

The DAF describes airspace management as the coordination, integration, and regulation of the use of airspace of defined dimensions. The objective of airspace management is to provide airspace in which the DAF test and training missions can be conducted as realistically as possible, while minimizing the impact on other aviation users, surface activities, and the environment (Department of the Air Force Manual 13-201, Airspace Management). Proposed project activities would not involve aircraft or result in any obstructions to airspace or hazards to airspace management at WPAFB. Therefore, there would be no impacts to airspace. Given the limited potential for environmental impacts, airspace management was eliminated from detailed analysis.

3.2 Cumulative Impacts Analysis

Evidence suggests the most adverse environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time (CEQ, 1997). CEQ regulations implementing NEPA require that cumulative impacts of a proposed action be assessed. Cumulative impacts "are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person

undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time." [40 CFR 1508.1(i)(3)]

CEQ's guidance for considering cumulative effects states NEPA documents should compare cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant. Assessing cumulative effects involves identifying and defining the scope of other actions and determining their interrelationship with the proposed action. One key consideration is whether other projects coincide with the location and timing of the proposed action. Past, present, and reasonably foreseeable future actions are examined, including military actions in the region as well as other federal and non-federal actions to determine if there is an interaction with the proposed action or alternative.

As WPAFB is an active military installation that undergoes changes in missions and training requirements in response to defense policies, current threats, and tactical and technological advances, it requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs on an on-going basis. In addition, tenant organizations occupy portions of the Base, conduct aircraft operations, and maintain select facilities. All these on-Base actions would continue to occur before, during, and after the Proposed Action would be implemented.

WPAFB has identified actions in the vicinity of the proposed EUL project sites that are in the planning stage. The effects of these actions are included in the cumulative effects analysis to the extent that concepts regarding such actions exist and the effects of the actions have a potential to interact with the effects of the Proposed Action. Table 3-1 presents potential future projects that have been identified in the EUL project area – Area B.

Timeframes and budgets for proposed projects listed in Table 3-1 can only be estimated or are uncertain. The incremental cumulative effects of the Proposed Action, when considered together with the effects of other past, present, and reasonably foreseeable future actions in the WPAFB region, are presented in each resource category based on the general type of project (e.g., military construction, demolition). Please note that only those resources that were identified in Table 3- 1 were carried forward for cumulative analysis. Other resource categories, analyzed for the Proposed Action, would not be cumulatively affected by these past, present, or reasonably foreseeable actions.

Military construction and demolition projects are also planned for Area A. The Military Construction (MILCON) projects include an entry control point (ECP) Gate 15A, an airmen dormitory, a new visiting quarters/temporary lodging facility project, Phase I renovation of 30 existing, historic housing units in the Brick Quarters, and intelligence centers. Of note for Area A is the demolition of several housing units: 10 Military Family Housing, 21 Transient Lodging

Facilities, and 3 Visiting Officer's Quarters. These temporary units are all scheduled for demolition in Fiscal Year 2029. Although potential impacts from Area A MILCON and demolition would be similar, the Area A projects would occur several miles away from the EUL parcels. The demolition process, while clearing several acres of land, would ultimately contribute to the base's overall open space. In addition, cumulative impacts would be expected from the total construction and demolition debris (c&dd) from multiple projects at WPAFB and within the community.

In addition to projects to be undertaken on base, projects planned for the communities in the immediate area of WPAFB are also considered for cumulative effects. The primary projects reviewed for this EA included Capital Improvement Plan projects for Beavercreek and Fairborn (city of Beavercreek, 2024; city of Fairborn, 2024). While a majority of individual projects are relatively small, they could collectively contribute to cumulative impacts in and around WPAFB. Examples include maintenance and repairs to roads and sidewalks, stormwater systems, and sanitary sewer systems. On a larger scale, some projects are planned to address modifications or upgrades of more extensive systems. Upgrades are needed on roads in the vicinity of WPAFB because of current congestion and the realignment of WPAFB gates for Area B. One example is the city of Fairborn's Growth Project Infrastructure Support Project that entails the design of sewer infrastructure extensions in support of economic development target areas (Fairborn, 2024). There are a number of projects listed in the plans that are indicative of the overall economic growth and urbanization in the vicinity of WPAFB. Actions associated with demolition, renovation, and construction of facilities and infrastructure could cumulatively impact resources such as air quality, noise, soil, water (especially stormwater), traffic and transportation, and occupational health and safety. Other specific resources such as cultural resources, biological resources, or hazardous materials/waste might also be impacted for some locations.

NEPA requires EAs to include identification of any irreversible and irretrievable commitment of resources that would be involved in the implementation of the Proposed Action. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources could have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals).

Environmental consequences resulting from the Proposed Action construction are considered short-term and temporary. Construction would require consumption of materials typically associated with construction (e.g., concrete, wiring, piping). The DAF does not expect the amount of these materials used to significantly decrease the availability of the resources. Small amounts of nonrenewable resources would be used; however, these amounts would not be appreciable and are not expected to affect the availability of these resources. Irretrievable effects

to vegetation/green space at the project sites would occur as a result of construction of the proposed facilities. However, there are other areas scattered throughout the Base that contain naturally-occurring vegetation as well as areas that had previously contained structures that were demolished and turned into green space. Therefore, the irretrievable loss of vegetation/green space at the EUL parcels could be a retrievable resource elsewhere on the Base and is not a significant loss when compared to the overall green space existing at WPAFB.

3.3 Noise

Noise is defined as an undesirable sound that interferes with communication, is intense enough to damage hearing, or is annoying. Human response to noise varies according to the source type, characteristics of the source, distance between source and receptor, receptor sensitivity, and time of day. Sound is measured with instruments that record instantaneous sound levels in decibels (dB), which characterize sound levels sensed by the human ear. "A-weighted" decibels (dBA) incorporate an adjustment of the frequency content of a sound to represent the way in which the average human ear responds to a sound event. Sound levels analyzed in this EA are A-weighted.

Two noise considerations must be assessed relative to the proposed EUL project:

- Location of the proposed EUL facilities relative to WPAFB aircraft operations.
- Potential noise impacts from the proposed EUL facilities (both construction and operational) on nearby noise receptors.

3.3.1 Regulatory Setting

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. Guidelines and regulations that are relevant to the project are described below.

AFI 32-1015 Integrated Installation Planning (updated January 4, 2021) establishes a comprehensive and integrated planning framework for the development and redevelopment of DAF installations to include noise effects on the surrounding communities. DoDI 4165.57 AICUZ December 13, 2021) establishes policies and responsibilities and prescribes procedures for the DoD AICUZ program for air installations. Air Force Handbook (AFH) 32-7084 (November 2, 2017) is the AICUZ Program Manager's guide to provide specific direction concerning the AICUZ program and its implementation. There is a diverse set of noise modeling software programs that accurately predict noise levels of fixed-wing aircraft, rotorcraft, sonic booms, small arms, and large caliber weapons. Both DoDI 4165.57 and AFI 32-1015 require the use of NOISEMAP and Rotorcraft Noise Model for predicting fixed-wing and rotorcraft noise levels respectively.

The DAF land use compatibility guidelines (relative to Day-Night Average sound level [DNL] values) are documented in AFH 32-7084, which uses dBA averaged over a 24-hour period. The DNL is the metric used by the DAF in determining noise impacts of military airfield operations for land use planning. Five noise zones are used in AICUZ studies and described in DoDI 4165.57 to identify noise impacts from aircraft operations. These noise zones range from DNL of 65 to 80 dBA and above. For example, it is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, or mobile home parks be located where noise is expected to exceed a DNL of 65 dBA.

The Federal Interagency Committee on Noise developed land-use compatibility guidelines for noise in terms of DNL (U.S. Department of Transportation, 1980). According to DAF, Federal Aviation Administration (FAA), and U.S. Department of Housing and Urban Development (HUD) criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds the DNL of 75 dBA, "normally unacceptable" in regions exposed to noise between the DNL of 65 to 75 dBA, and "normally acceptable" in areas exposed to noise where the DNL is 65 dBA or less.

For outdoor activities, the USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA, 1974).

If noise-sensitive structures are located in areas with a DNL of 65 to 75 dBA, the structures should be designed to achieve a DNL of 25 to 30 dBA interior noise reduction. Noise-sensitive structures might include schools, concert halls, hospitals, and nursing homes. Elevated noise levels in these structures can interfere with speech, causing annoyance or communication difficulties. Some commercial and industrial uses are considered acceptable where the noise level exceeds a DNL of 65 dBA.

3.3.2 Affected Environment

The *2022 WPAFB Air Installations Compatible Use Zones Study* was reviewed for this EA (WPAFB, 2022a). The WPAFB Area B airfield is normally closed. The National Museum of the U.S. Air Force only uses the runway to bring in aircraft for special events. Primary WPAFB aircraft operations utilize the runways in Area A. The operational noise footprint at WPAFB Area A is displayed in Figure 3-1 relative to the location of the proposed EUL parcels. This diagram displays the AICUZ contours. Refer to the WPAFB AICUZ Study (2022a) for a detailed description of the noise contours.

To further evaluate potential noise impacts at representative residential locations bordering WPAFB, an ambient noise survey was conducted in December 2021. The survey methods are described in Appendix B. This study used A-weighted, equivalent sound pressure level (LA_{eq})as

the sound level metric to measure ambient noise. LA_{eq} represents the A-weighted equivalent continuous sound pressure level averaged over 1 hour (see Appendix B for explanation of the noise metrics). The $LA_{eq(1hr)}$ for the four sampling locations, shown on Figure 3-2, ranged from 53.1 dBA to 66.3 dBA (Table 3-2). These measured sound levels are typical of many urban areas. Figure 3-2 also shows the approximate distance from the proposed EUL parcels to the nearest respective sampling location – NS3, across National Road from the Hilltop Parcel, and NS2 west of the Gerlaugh Farm Parcel.

In addition to aircraft operations from WPAFB Area A, existing conditions noise sources include traffic noise from State Route 444, a four-lane highway, and State Route 4, a two-lane road, both north of the project location, and Interstate 675 south and east of the project location. Other ground transportation noise sources include various types of vehicles both on and off the installation on surface roads, including National Road and the Colonel Glenn Highway.

3.3.3 Environmental Consequences

This noise impact analysis evaluates potential changes to the existing soundscape that would result from implementation of the Proposed Action. Potential changes in the noise environment can be beneficial (i.e., a reduction in the number of sensitive receptors exposed to unacceptable noise levels), minimal (i.e., no noticeable change in ambient noise levels), or adverse (i.e., increased noise exposure to unacceptable noise levels). For the purposes of this EA, the impact to the soundscape would be considered adverse if the ambient noise levels increased with an hourly LA_{eq} of 10 dB, which would be perceived as a doubling of the ambient noise level.

3.3.3.1 Proposed Action

As shown on Figure 3-2, both the proposed Hilltop Parcel and the proposed Gerlaugh Farm Parcel are located within the existing 65 dB to 70 dB DNL WPAFB Area A AICUZ noise contour. Refer to WPAFB 2022 AICUZ Study, Table A-2, for required noise level reductions. Per Table A-2, the proposed mixed-use facilities are compatible with the 65-70 dB DNL zone, except the proposed hotel that would require an additional 5 dB noise level reduction (NLR) over standard construction techniques (25 dB NLR total). It is noted that the AICUZ noise contours are based on the WPAFB historical operations Potentially affected noise receptors around the Hilltop Parcel include existing WPAFB operations in Area B, primarily the AFIT to the west, two childcare centers to the west, the Air Force Research Laboratory (AFRL) to the south, and several businesses and residences across National Road to the east. Multiple additional apartment building complexes are located further east across National Road approximately 400 feet from the Hilltop Parcel.

Potentially affected noise receptors around the Gerlaugh Farm Parcel are primarily a residential neighborhood directly to the west (including the NS2 noise sampling location), a small business directly to the south, and an existing large business approximately 800 – 900 feet down Mission

Point Boulevard to the south. WPAFB operations to the north are the open Area B airfield runways, and land to the east and south (towards I-675) is undeveloped open space and forest.

Construction Noise Impacts

Construction equipment that would be used in the proposed EUL construction and their typical sound pressure levels at relevant receptor distances are shown in Appendix B, Tables 3 and 4 for the proposed Hilltop Parcel and the proposed Gerlaugh Farm Parcel respectively. Each table is a list of the planned construction activities, and the month and year for the start of each activity for each building. Each activity lists the general equipment consistent with that used for air quality analysis[1]. Noise from each type of equipment was calculated using the Federal Highway Administration Roadway Construction Noise Model to the assumed closest residence.

Principal construction noise impacts at the Hilltop Parcel would occur during the initial phase of construction, which would include primary site work and construction of Building #1. Construction of Building #2 and #4 would follow a year later. Subsequent construction would involve one building at a time over a period of years. The distance calculated from the Hilltop construction site to the nearest residence across National Road is 135 feet. Graders are the loudest type of equipment, followed by tractors and loaders, all typically used during site preparation. For the Hilltop site, these noise levels are approximately 10 dBA over the measured ambient level (Table 3-2). Generally, people perceive 10 dB as a doubling of the noise in a soundscape.

All construction operations would generally occur during the day expected to start at 7 AM and conclude at 7 PM. Residents nearest the construction site may experience as much as 10 dBA levels higher than ambient while outside during construction operations. Impacts would primarily be interruptions in speech while two or more residents are talking or while talking on a mobile phone. Noise levels would not be high enough to cause temporary hearing impairment. Interior noise levels are typically attenuated by 15 to 25 dBA depending on many factors, including building construction, window construction, whether the windows are open or closed, and other interior noise, such as televisions and radios. Another factor affecting the overall soundscape is the vehicle noise from National Road. The ambient noise study included traffic noise from National Road. Any additional noise from construction workers' vehicles arriving to and leaving from the job site would add to the ambient level, but it is uncertain as to how it would affect the noise levels since the speed of the traffic would slow down and the number of vehicles would increase. Automobile noise contributing to the overall soundscape may increase

1 Bryson, Russell 12 March 2024, BioLargo Engineering, Science & Technologies, LLC, *ACAM Detail Report_rev1*

by 1–3 dBA during rush hour traffic, but not be perceived as an increase since most people have difficulty distinguishing differences less than 3 dB.

In addition, the Wright Field Child Development Center is located approximately 225 feet west of the proposed Hilltop EUL site. Children outside the Development Center may experience construction noise between 55-66 Leq dBA (Lmax 61-68 dBA). Children playing on the playgrounds behind the building would experience levels lower than this, except for the fact that the noise from children playing would be higher. Inside the Child Development Center, the construction noise would be attenuated by at least 20 dB, so there would be no effects of construction noise disrupting classroom teaching and learning.

Other WPAFB operational facilities (AFIT, AFRL) are located similar distances from proposed Hilltop EUL construction activities but generally do not have outdoor activities and are not considered sensitive receptors.

Proposed construction at the Gerlaugh Farm EUL site would be phased from west to east starting with Building 5. Subsequent buildings would be constructed progressively farther away from residents. The distance calculated from the construction site to the nearest residence thus varied with Building 5 estimated to be 63 feet from the nearest residence; Building 8, 780 feet; Building 10, 1,005 feet; and Building 12, 1,125 feet. For the Gerlaugh Farm site, the noise levels for Building 5 construction are approximately 20 dBA over the measured ambient level (Table 3-2). Generally, people perceive 10 dB as a doubling of the noise in a soundscape. The levels drop off for construction noise at Buildings 8, 10, and 12 to levels at or below ambient. These calculations also do not account for shielding by each new building between new construction and the nearest residence.

As with the proposed Hilltop EUL development, the proposed Gerlaugh Farm EUL construction activities would generally occur during the day expected to start at 7 AM and conclude at 7 PM. Residents nearest the Building 5 construction site may experience as much as 20 dBA levels higher than ambient while outside during construction operations. Temporary impacts would primarily be interruptions in speech while two or more residents are talking or while talking on a mobile phone. Noise levels would not be high enough for a length of exposure time to cause temporary hearing impairment. Interior noise levels are typically attenuated by 15 to 25 dBA depending on many factors, including building construction, window construction, whether the windows are open or closed, other interior noise like televisions, radios, etc. Another factor affecting the overall soundscape is the vehicle noise from Colonel Glenn Highway. The ambient noise study included traffic noise from the highway. Any additional noise from construction workers' vehicles arriving to and leaving from the job site would add to the ambient level, but it's uncertain as to how it would affect the noise levels since the speed of the traffic would slow down and the number of vehicles would increase. Noise from construction of Building 8, 10, and

12 would be at or below ambient levels for residents outside of their homes and residences should experience no impact from the noise.

Therefore, implementation of the Proposed Action would have limited, temporary effects on the noise environment during the construction phases of each EUL project.

Operational Noise Impacts

Once operational, noise sources associated with the proposed EUL office buildings would be very limited and include primarily HVAC fans and compressors (typically located in shielded rooftop enclosures) and intermittent noise sources such as dumpster waste removal and landscaping. No emergency generators would be installed at either proposed EUL site.

As indicated with construction noise, children are present daily during the workday at the WPAFB childcare facilities approximately 225 feet west of the proposed Hilltop Parcel during the same operating hours as expected for the proposed office development. As part of the proposed EUL development, the existing WPAFB security fence would be relocated from National Road to the western boundary of the Hilltop Parcel, providing some safety-related separation from the proposed Hilltop EUL operational activities. Although the boundary fence would not prevent noise during routine operations at the Hilltop Parcel, the effects would be insignificant because building materials would attenuate noise levels from operations while children are inside the facilities. The outdoor play area and playground equipment are located in back of the childcare facility, which is on the opposite site of the building from the Hilltop parcel. Therefore, noise from the Hilltop parcel would be attenuated by greater distance and from the building itself.

Principal noise sources would be due to additional traffic on National Road accessing the Hilltop Parcel and on the Colonel Glenn Highway and Airway Road accessing the Gerlaugh Farm Parcel. Traffic noise associated with the proposed office buildings, predominant at both proposed EUL parcels, is typically concentrated around the morning and evening rush hours, with smaller peaks around lunch. Traffic profiles differ for the restaurant, retail and hotel uses, with more distribution across operating hours and smaller peaks in general, centered more around the lunch and dinner time periods. Although traffic volume at both sites would increase, traffic would be slowing for turns to enter or leave each site so specific impact to ambient noise levels is unclear – the ambient noise profile would be altered, with noise contributing to the overall soundscape increasing by 1–3 dBA during rush hour traffic, but not be perceived as an increase since most people have difficulty distinguishing differences less than 3 dB. Therefore, the new EUL facilities operations would contribute to a limited amount of additional noise primarily from additional traffic.

3.3.3.2 No Action Alternative

Under the No Action Alternative, new building construction would not occur on the proposed EUL parcels and the existing soundscape would be unchanged.

3.3.4 Cumulative Impacts

Principal noise impacts from proposed EUL development would be from construction activities at nearby residential and childcare receptors. Locally to the proposed EUL sites, the proposed Human Performance Wing Laboratory (2027) and AFIT Research Laboratory (2026 – 2030) are close enough to the Hilltop EUL site that concurrent construction activities from site preparation and construction equipment could contribute to the noise environment of the Wright Field Child Development Center, and potentially at residences across National Road. WPAFB would subjectively monitor local construction noise in these areas and investigate any noise complaints received. If necessary, construction activities would be curtailed or mitigated in response.

Operational noise impacts from proposed EUL development would generally be expected to be limited to peak traffic times. Cumulative operational impacts from traffic accessing new Area B facilities via Gate 19B or Gate 22B would be addressed as part of local traffic planning studies. Traffic noise impacts would similarly be limited as cumulative new operational traffic would be slowing to make entry/exit movements or for gate entry security inspection.

3.4 Land Use

Land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. This section describes the land use classifications at the Hilltop and Gerlaugh Farm Parcels.

3.4.1 Regulatory Setting

Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of descriptive terms used to categorize land use resulting from human activity including residential, commercial, industrial, agricultural, institutional, and recreational.

Land use planning objectives are two-fold: to ensure orderly growth and ensure compatible uses among adjacent property parcels. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project sites and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations.

To address land use with respect to noise and safety associated with aircraft operations, the DoD requires military departments to establish an AICUZ program. The goal of AICUZ is to promote

compatible land use around air bases by providing information concerning aircraft operations, noise exposure, and accident potential to local governments (WPAFB, 1995a; WPAFB, 2022a). Potential noise exposure associated with WPAFB's AICUZ is addressed in Section 3.2.

The 2022 AICUZ utilizes the noise planning contour that was established historically for WPAFB to provide consistency when zoning and land use policies in the community are established. Local zoning does not need to be adjusted with changes in missions because the noise contours were based on conservative assumptions regarding future missions. Therefore, the noise contours in the 2022 AICUZ remain in effect for local community planning purposes. Noise contour analysis is addressed in Section 3.2 of this EA.

The AICUZ program is also intended to reduce the potential for aircraft mishaps in populated areas. As a result of this program, WPAFB has altered basic flight patterns to avoid heavily populated areas. In addition, airfield safety zones were established under AICUZ to minimize the number of people who would be injured or killed if an aircraft crashed. Three safety zones are designated at the end of all active runways: Clear Zone (CZ), Accident Potential Zone (APZ) I, and APZ II.

The CZ represents the most hazardous area. The APZs are outside of the CZs. The APZ I is located immediately beyond the CZ and has a high potential for accidents. The APZ II is immediately beyond APZ I and has measurable potential for accidents. While aircraft accident potential in APZs I and II does not necessarily warrant acquisition by DAF, land use planning and controls are strongly encouraged for the protection of the public. Compatible land uses are specified for these zones. According to AFI 32-1015, all new construction is required to comply with the AICUZ.

The DoD and FAA also identify a complex series of imaginary planes and transition surfaces, known as the Hazards to Aircraft Flight Zone, that together define the airspace needed to remain free of obstructions around an airfield. The Hazards to Aircraft Flight Zones typically include structure height restrictions that vary by surface and distance from the runway.

3.4.2 Affected Environment

There is a wide variety of land use classifications on WPAFB. Open Space and Outdoor Recreation represent some of the land constrained from development. Over 2,000 acres of this undeveloped land lies within the natural constraints area that is composed of floodplains, lakes, wetlands, or areas with unsuitable soil for building. Also located within the natural constraints area is the 109-acre Huffman Prairie, which is designated an Ohio Natural Landmark and contains remnant prairie habitat that includes several rare plant and animal species.

Human-made constraints also restrict development within the WPAFB boundaries. Included in these types of constraints are archaeological sites and historic buildings, which can be identified sites or those that remain undiscovered. Operational restrictions can also impede development. Noise contours from aircraft operations and explosive safety zones must be considered when looking at developing areas on the Base. Airfield and airspace control surfaces, such as runway approach CZs, are to remain clear of building obstructions. The presence of past waste disposal sites and fire training areas must be considered when siting facilities (WPAFB, 1995a).

Land uses around WPAFB vary from heavily urbanized to rural agricultural. Most of the urbanized areas are west of the Base, with the low-density or agricultural area located east of the Base.

Most of the land surrounding WPAFB that is impacted from Base activities is compatible with Base operations. Progressive land use controls have been the most important factor concerning compatible development within noise and APZs at WPAFB (WPAFB, 1995a; WPAFB, 2022a). There are also natural areas located on or near WPAFB including Mad River, Huffman Prairie, the Licensed Shooting Preserve, and several regional and local parks. Areas of riparian woodland also exist along the Mad River as well as upland prairie that has been restored at Eastman Park.

Land use on Base is classified as the following types: residential, commercial, industrial, institutional, open space, vacant/agricultural, and airports (Figure 3-3). WPAFB conducts comprehensive land use planning in its Installation Development Plan (WPAFB, 2014), which established ten planning districts throughout the Base (six in Area A and four in Area B). Additional area development plans provide more specific planning focus for individual directorate development. The proposed Hilltop Parcel is located in District 9d. Permitted uses in District 9d include Administrative, Small-Scale Administrative, and Open Space. Industrial, Light Industrial, Community Services, Small-Scale Retail and Service, and Outdoor Recreation functions are permitted with restrictions. The proposed Gerlaugh Farm Parcel is located in District 7b. Permitted uses in District 7b include Outdoor Recreation and Open Space, with Light Industrial, Administrative, and Small-Scale Administrative functions permitted with restrictions.

Although the proposed EUL parcels would remain DAF property, compatibility with local planning and zoning codes are of interest to community stakeholders. Adjacent property to both parcels is within the city of Beavercreek who conducts land use planning via the Beavercreek Planning Commission and institutes land use restrictions via the Beavercreek Zoning Ordinance. Some property across National Road from the proposed Hilltop Parcel falls within the city of Fairborn and Greene County, Bath Township.

WPAFB land use controls have also been established for portions of the base subject to the IRP, in the *Land Use Control Implementation Plan* (LUCIP; WPAFB, 2019) as detailed in Section 3.10.

3.4.3 Environmental Consequences

Potential impacts on land use are based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. A land use impact would be adverse if it met the following criteria:

- Inconsistency or noncompliance with existing land use plans or policies.
- Precluded the viability of existing land use.
- Precluded continued use or occupation of an area.
- Incompatibility with adjacent land use to the extent that public health or safety is threatened.
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

3.4.3.1 Proposed Action

The proposed EUL parcels are both located in Area B of WPAFB. The proposed Hilltop Parcel is currently Recreational open space with walking paths throughout the parcel with maintained lawn. Although development of the parcel would represent a substantial loss of that land use, the proposed mixed-use development, primarily office buildings with some retail, food service and hotel, would be generally compatible with the existing adjacent Area B land use. Current land use near the Hilltop Parcel is primarily educational and includes offices at the AFIT and childcare facilities south of AFIT. The proposed new development would be separated from those uses by the relocated Base security fence, which would mitigate potential incompatibilities with those existing WPAFB facilities. The proposed mixed-use development is permitted or permitted with restrictions in District 9d, with the exception of the hotel which is restricted District 9d (Lodging). Inclusion of a hotel ("lodging") would require a land use exception approval by the WPAFB Facility Board prior to construction. The proposed Gerlaugh Farm Parcel is currently Open Space consistent with the Area B Development Plan. The proposed development of the Gerlaugh Farm Parcel would be a partial loss of open space because no development of the eastern portion of the property (toward the I-675 interchange) is currently planned. The proposed office development would generally be compatible with the existing WPAFB privatized development adjacent to the west since there are no direct connections planned between the two parcels. The proposed Gerlaugh Farm Parcel is also directly across the Colonel Glenn Highway from the Area B airfield and so should be compatible land use, subject

to any AICUZ restrictions. The proposed office buildings are permitted with restrictions in District 7b.

Both proposed EUL parcels are subject to structure height restrictions associated with aircraft operations and the WPAFB AICUZ. At the proposed Hilltop Parcel, the most restrictive height restriction (90 feet) results from radar and other electronic signal operations at the AFRL facilities south of the Hilltop site. The proposed Gerlaugh Farm Parcel is subject to a 50-foot height restriction included in the WPAFB Airport Zoning Regulation adopted as a result of the AICUZ by WPAFB and the four surrounding counties and administered by Montgomery County. The north/northeast corner of the site also falls within an Area B runway CZ restricting any new building construction in that area.

The Beavercreek Land Use Plan classifies the properties across National Road from the Hilltop Parcel as "Colonel Glenn Planning Area" (CGPA)-2 as Community Commercial – Office. Under the city's Zoning Ordinance, the area is currently zoned Agricultural (A1) and Business (B2). The proposed Mixed-Use/Office development for the Hilltop Parcel should be consistent with CGPA-2 and B2 designations. Some parcels across National Road from the proposed Hilltop Parcel are within the city of Fairborn at the western end of its University District with a mix of residential and office land use (Fairborn Comprehensive Land Use Plan, 2016). The Fairborn Zoning Map classifies these parcels as Professional Office or Planned Development. The proposed Mixed-Use/Office development for the Hilltop Parcel should generally be compatible with the Professional Office designation but less so with the existing residential and Planned Use designation, which in this portion of the University District, reflects multi-unit housing associated with Wright State University. The Hilltop Parcel is also located within Bath Township in Greene County, with nearby property zoned as R2 (Low Density Residential) and B1 (Business District).

The Beavercreek Land Use Plan classifies the property adjacent and south of the proposed Gerlaugh Farm Parcel as CGPA-1 Mixed-Use/Vacant Planning Area 8. The city approval for this development allows for up to 1.45 million square feet of mixed-use including commercial, office, and residential. The proposed office development for the Gerlaugh Farm Parcel should be compatible with the CGPA-1 designated use. Under the city's Zoning Ordinance, the adjacent property is zoned "MX PUD 06-6" for mixed-use planned unit development and approved by the City Council.

The Hilltop Parcel is currently Recreational open space, so the proposed EUL development would result in a substantial loss of open space and recreational use to local, immediate community stakeholders such as WPAFB personnel who routinely use that space for recreation, or perhaps to residents and businesses across National Road who value the visual open space. At a larger geographic scale (across WPAFB in total or across Area B, or across a wider area of

Greene County), these losses are comparatively minor. The proposed mixed-use development would be generally compatible with other nearby WPAFB land use with mitigation from the relocated security fence. Under the WPAFB LUCIP (see Section 3.10), the Hilltop Parcel is classified as Recreational open space and would require reclassification as commercial/industrial. Once the EUL lease would be finalized and signed, the LUCIP would be annotated to indicate the land use change has been implemented. The Gerlaugh Farm parcel is currently open space, so the EUL development would also result in a substantial loss of open space. Both parcels are otherwise generally compatible with adjacent land use and zoning qualifications.

3.4.3.2 No Action Alternative

Under the No Action Alternative, new building construction would not occur on the proposed EUL parcels and the existing land use would remain the same.

3.4.4 Cumulative Impacts

At full buildout, the proposed Hilltop EUL Development would convert 15.8 acres of the total 22 acres (69%) of green space (maintained mowed lawn and occasional sparse trees) to impervious surfaces (parking lot, buildings). At full buildout, the proposed Gerlaugh Farm EUL Development would convert 7.7 acres of the 22 acres (33.4%) of the 22-acre site of existing green space (mowed lawn, scrub vegetation and trees) to impervious surfaces (parking lot, buildings). Disturbed areas on the proposed EUL project sites would be re-vegetated as needed. In accordance with WPAFB policy, any trees removed at either proposed EUL site would be replaced at a 3-to-1 ratio. Of the 8,145 acres on WPAFB, 2,000 acres consists of undeveloped land with natural constraints composed of forests/woodlands (709 acres), prairie (109 acres), fields/grasslands (388 acres), wetlands (23 acres) and mowed areas consisting of airfields, parks and golf courses (771 acres). Compared with the 2,000 acres of undeveloped land, the 23.5 acres of converted land to impervious surfaces results in 1.2% reduction of existing green space across the base, which would not be a significant impact to overall green space.

3.5 Air Quality/Climate Change

Air quality and climate change are discussed and evaluated in the following sections.

3.5.1 Regulatory Setting

As described in Air Force Manual (AFMAN) 32-7002, the Air Quality Compliance and Resource Management Program identifies essential DAF requirements and actions to manage DAF air resource assets in order to maximize their military value and optimize their economic, ecologic, and community value, while attaining and maintaining compliance with the 42 USC 7401 – 7671q of the Clean Air Act (CAA) and applicable state and local air quality regulations. Air quality within a defined geographical region is most often determined by measuring the

concentration of various pollutants in the atmosphere. The federal Clean Air Act directed the USEPA to develop National Ambient Air Quality Standards (NAAQS; this abbreviation will also be used here to refer to the National Ambient Air Quality Standard) to protect public health and welfare. The NAAQS are numerical concentration-based standards for pollutants that have been determined to impact human health and the environment. The USEPA currently enforces both primary and secondary NAAQS for six criteria air pollutants including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (coarse particulates equal to or less than 10 microns in diameter [PM_{10}] and fine particulates equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). Ambient air quality that falls below the NAAQS is classified as in "attainment" and ambient air quality that exceed the NAAQS is classified as "nonattainment." Nonattainment areas in which air quality has improved sufficiently to be re-designated to attainment are classified as "maintenance" areas. The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies.

The CAA also required that the USEPA promulgate General Conformity Regulations (GCR; 40 CFR Part 93, Subpart B) to ensure that federal actions will conform to the state implementation plan (SIP) so as not to impede local efforts to achieve or maintain attainment with the NAAQS. The GCR requires a conformity determination for all federal actions located in nonattainment or maintenance areas for NAAQS unless otherwise exempted. Federal actions may be assumed to conform if total indirect and direct project emissions are below *de minimis* levels presented in 40 CFR 93.153. The threshold levels (in tons of pollutant per year) depend upon the nonattainment or maintenance area status that USEPA has assigned to a region for each NAAQS and the specific NAAQS pollutant. Once the net change in nonattainment or maintenance area pollutants are calculated, the federal agency must compare them to the *de minimis* thresholds to determine if a conformity determination is required.

The DAF applies insignificance indicators to actions occurring in areas that are in attainment or unclassified for a NAAQS to provide an indication of the significance of potential impacts to air quality. Areas where an air pollutant is within five percent of a NAAQS are considered near nonattainment and the insignificance indicator used to evaluate actions in these areas is 100 tons per year (tpy) for all criteria pollutants besides lead. The insignificance indicator used to evaluate actions in areas that are clearly attainment (not within 5 percent of exceeding a NAAQS) is the USEPA Prevention of Significant Deterioration (PSD) permitting threshold of 250 tpy of a criteria pollutant besides lead. The insignificance indicator for lead in both areas is 25 tpy. The insignificance indicators do not denote a significant impact; however, they do provide a threshold to identify actions that have insignificant impacts to air quality. Any action with net emissions below the insignificance indicators is considered so insignificant that the action would not cause or contribute to an exceedance of any NAAQS.

The DAF developed the Air Conformity Applicability Model (ACAM) to quantify project emissions for comparison to GCR de minimis thresholds in nonattainment and maintenance areas, and for comparison to insignificance indicators in attainment or unclassifiable areas.

3.5.1.1 Air Quality Regulations Applicable to Stationary Sources and New Source Review

Local and regional pollutant impacts resulting from direct and indirect emissions from stationary emission sources under the Proposed Action are addressed through federal and state permitting program requirements under New Source Review regulations (40 CFR 51 and 52). Local stationary source permits are issued by Ohio EPA and enforced by the Ohio EPA Regional Air Pollution Control Agency office in Dayton. WPAFB has appropriate permits in place and has met all applicable permitting requirements and conditions for existing stationary devices.

3.5.1.2 National Emissions Standards for Hazardous Air Pollutants

The federal National Emissions Standards for Hazardous Air Pollutants (NESHAP) are promulgated in 40 CFR 61 and 63. These NESHAP require emissions control measures and detailed recordkeeping to show compliance with NESHAP restrictions. NESHAP are established for specific emission source categories, several of which are present at WPAFB and referenced in the Base operating permits. Compliance demonstration requirements for applicable NESHAPs are identified within the operating permit conditions.

3.5.1.3 Fugitive Dust Regulations

The Ohio Administrative Code (OAC) rule 3745-15-07 declares dust escaped from any source in such manner or in such amounts as to endanger the health, safety or welfare of the public, or cause unreasonable injury or damage to property, to be a public nuisance. Pursuant to OAC rule 3745-17-08(A)(2), the Ohio EPA Director may require any source that causes or contributes to such a nuisance to submit and implement a control program which will bring the fugitive dust source into compliance with the rule. Pursuant to OAC rule 3745-17-08(B), construction and other activities that have the potential to generate fugitive dust shall take or install reasonably available control measures (RACMs) to minimize or eliminate visible particulate emissions of fugitive dust. The RACMs can include, but are not limited to:

- Apply water or other dust control chemicals to roads and surfaces as applicable.
- Cover open-bodied trucks during the transport of material.
- Promptly remove debris from paved surfaces to minimize and prevent re-suspension.

3.5.1.4 Architectural and Industrial Maintenance Coating Regulations

The OAC rule 3745-113, Architectural and Industrial Maintenance (AIM) Coatings, applies to any person who supplies, sells, offers for sale, repackages for sale, manufactures or blends any AIM coating for use within the state of Ohio, as well as any person who applies or solicits the

application of any AIM coating within the state of Ohio. At a minimum, the coating specifications for any construction activity associated with the Proposed Action must conform to the volatile organic compound (VOC) content standards identified in the OAC rule 3745-113-03 for each specific AIM coating type anticipated for application. The localized environmental impacts of the coating applications may be reduced by specifying the use of no-VOC or low-VOC content coatings used in construction.

3.5.1.5 Greenhouse Gases

The DAF has adopted the Prevention of Significant Deterioration threshold for greenhouse gases (GHGs) of 75,000 tons per year (tpy) of carbon dioxide equivalent (CO_2e) (or 68,039 metric tpy) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant. Actions with a net change in CO_2e emissions below the insignificance indicator are considered too insignificant on a global scale to warrant any further analysis.

3.5.1.6 Social Cost of Greenhouse Gases

The potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with an action. It is a tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from a GHG emissions' effect on climate change. Annual estimates are found by multiplying the annual emission for a given year by the corresponding Interagency Working Group (IWG) Annual SC GHG Emission value (an annual unit cost per metric ton). The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under EO 13990," released by the IWG SC GHGs in February 2021.

3.5.2 Affected Environment

This section describes the affected environment for air quality on a regional basis.

3.5.2.1 Regional Climate

The climate of the southwestern region of Ohio is humid and temperate with warm summers and cold winters. Average minimum and maximum temperatures are between 20 and 35 degrees Fahrenheit (°F) in January and 65 and 84 °F in July. The average annual precipitation is 41.06 inches, with June typically being the wettest month and October the driest month. The prevailing winds are from the southwest, with average monthly wind speeds between 3 and 7 knots (3.5 to 8 miles per hour).

3.5.2.2 Regional Air Quality

Air Quality Control Regions (AQCRs) are federally designated areas that are required to meet and maintain federal ambient air quality control standards. WPAFB is located in Greene and Montgomery counties, which is part of the Metropolitan Dayton Intrastate AQCR (40 CFR 81.34). The Metropolitan Dayton Intrastate AQCR is currently classified as an Orphan Maintenance Area for the 1997 Ozone NAAQS (redesignated August 13, 2007) and in attainment for all other criteria pollutants. Therefore, for the proposed action, the precursors for ozone (VOC and NOx) emission estimates will be compared with the *de minimis* value while all other criteria pollutants are compared with the PSD value of 250 tons per year (except lead).

The WPAFB air emissions inventory includes over 1,200 emissions sources, principally natural gas-fired boilers; research and development sources, such as laboratory fume hoods and test cells; paint spray booths; refueling operations; and emergency power generators. The most recent renewal of the Title V operating permit was issued to WPAFB on September 17, 2021. There are 18 permitted significant emissions unit identified in the permit, most of which are boilers, paint spray booths, and combustion research cells. Most of the stationary sources at WPAFB are classified by Ohio EPA to be insignificant or *de minimis* because of low potential emission levels. *De minimis* sources are exempt from air permitting requirements provided the emission source meets the requirements of OAC rule 3745-15-05. The Air Program Manager at WPAFB requires notification prior to installation, removal, or relocation of any air source.

WPAFB was previously considered a major NESHAP source because it had the potential to emit 25 tons or more per year of combined hazardous air pollutants (HAPs); however, in 2020 WPAFB accepted permit limitations categorizing it as a "synthetic minor" ("area") source, simplifying future NESHAP permitting and compliance.

3.5.3 Environmental Consequences

The environmental consequences to local and regional air quality conditions near a proposed federal action are determined based on the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. For the purposes of this EA, the impact in NAAQS "attainment" areas would be considered significant if the net increases in pollutant emissions from the federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard.
- Expose sensitive receptors to substantially increased pollutant concentrations.
- Exceed any Evaluation Criteria established by a SIP.

For air sources from federal actions that do not require review for air permitting, the primary tool used to evaluate air impacts is the application of the GCR. The DAF uses the ACAM to determine when a General Conformity Determination is required.

3.5.3.1 Proposed Action

Construction of the proposed office and mixed-use EUL developments includes typical construction activities for site preparation, building erection, parking lot pavement, and installation of new equipment. Installation activities would result in emissions of criteria pollutants from the equipment engine exhaust and particulate matter emitted as fugitive dust from site preparation, excavation and trenching activities, paving activities, and the movement of material and equipment. Additionally, vehicle emissions from the delivery trucks are included along with worker commuter emissions. VOC emissions would result from incidental painting, surface coating and asphalt paving required for the project (proposed EUL construction would use prefinished architectural panels rather than field-applied architectural coatings). Because each module in the ACAM only includes the number of workers operating equipment, a separate category for transient workers commuting was included to account for contractors performing specific equipment installation, testing, and project supervision. All emissions from construction activities would be temporary. Ongoing emissions would result from newly installed equipment (i.e., rooftop HVAC units) and from permanent employee vehicle emissions. If any stationary on-site power generation equipment is installed, the applicable permits would be obtained by the developer.

ACAM was used to estimate project emissions and complete the GCR applicability analysis, assess impacts to attainment NAAQS (and precursors), and complete a GHG/SC GHG analysis. Criteria pollutant emissions, GHG emissions, and the SC GHG resulting from the Proposed Action are summarized on an annual basis until steady state, when the net gain/loss in emissions is stabilized and the action is fully implemented (see Table 3-3, below, and Appendix C).

The annual net change in estimated criteria pollutant emissions associated with the Proposed Action is less than the General Conformity *de minimis* threshold of 100 TPY for VOC and nitrogen oxides (NO_x) and the DAF insignificance indicators of 250 TPY for all other criteria pollutants. A General Conformity Determination would not be required. The annual net change in GHG emissions would be less than the insignificance indicator of 68,039 metric tons of CO_2e. Therefore, all criteria pollutant and GHG emissions would be insignificant and would not cause or contribute to an exceedance of NAAQS; therefore, the Proposed Action would have an insignificant impact on Air Quality.

Operationally, the limited air emission sources associated with the proposed EUL development would be under the control of the proposed EUL developer, not WPAFB, so those sources would not fall under the auspices of the WPAFB Title V permit. The only permanent operational

stationary air emission sources would be rooftop HVAC units all of which would fall below the Ohio EPA permit-to-install exemption level of 10 MMBtu per hour natural gas heat input [OAC 3745-31-03(B)(1)(a)]. (No emergency generators would be planned for installation. If any stationary on-site power generation equipment is installed in the future, the applicable permits would be obtained by the developer.). Vehicle exhaust emissions from additional traffic associated with the proposed mixed-use development would continue to contribute local air quality degradation, but based on ACAM analysis would not trigger the requirement for a General Conformity Determination.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* requires federal agencies, to the extent permitted by law and consistent with the agency's mission, to identify and assess environmental health and safety risks that may disproportionately affect children. The order defines these risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on, and the products we use or are exposed to)."

Potential effects on children are considered with respect to air quality during construction and operations. Children at the childcare facilities would not be totally protected by a security fence as air emissions from construction and operations at the Hilltop Parcel would be as close as 225 feet. Children residents adjacent to and directly west of the proposed Gerlaugh Farm Parcel would also be susceptible to air quality impacts of the proposed development; however, these impacts would be comparatively less than those of the Hilltop Parcel. The nearest residences at the Properties at Wright Field are over 400 feet from the property boundary for the Gerlaugh Farm Parcel.

Primary standards under the Clean Air Act provide public health protection, including sensitive populations such as children. Based on the results of the ACAM analysis (Table 3-3), the estimated criteria pollutant and GHG emissions are lower than the General Conformity *de minimis* threshold for VOC and nitrogen oxides (NO_x) and the DAF insignificance indicators for all other criteria pollutants. While children may be more sensitive, the standards are intended to be protective.

3.5.3.2 No Action Alternative

Under the No Action Alternative, the proposed EUL Development projects would not be constructed at WPAFB, and existing conditions would remain the same. No new air emissions would be generated. Therefore, there would be no short- or long-term impacts because there would be no change in air emissions over baseline conditions.

3.5.4 Cumulative Impacts

Construction activities associated with the proposed EUL development projects and concurrent actions would have the potential to impact overall air quality emissions. Nearby to the proposed Hilltop EUL site, WPAFB is proposing to construct new laboratories to the Human Performance Wing (2027) and AFIT (2026–2030). Concurrent construction activities from these projects may contribute to impacts to local air quality, however no significant cumulative impacts to air quality are anticipated. Each project would utilize a fugitive emissions plan to control dust emissions, as well as the construction activities would be monitored by base personnel.

3.6 Cultural Resources

The cultural resources at WPAFB are described in the following sections.

3.6.1 Regulatory Setting

Several federal laws and regulations govern protection of cultural resources, including the National Historic Preservation Act (NHPA) (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990. As defined by 36 CFR 800.16, historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion, the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties, as well as properties of traditional religious and cultural importance to a Native American tribe or Native Hawaiian organization and that meet the NRHP criteria.

Typically, cultural resources are subdivided into archeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity, but no structures remain standing) or architectural resources (buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance). Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., arrowheads and bottles).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered for the NRHP. More recent structures might warrant protection if they have potential as Cold War-era resources. Structures less than 50 years in age, and particularly DoD structures in the category of Cold War-era, are evaluated under explicit guidance of the National Park Service Bulletin 22.

The EA process and the consultation process prescribed in section 106 of the NHPA requires an assessment of the potential impact of an undertaking on historic properties that are within the

proposed project's Area of Potential Effect (APE). An APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." In accordance with Section 106 of the NHPA, determinations regarding the potential effects of an undertaking on historic properties are presented to the SHPO.

Native American tribes define cultural resources very broadly as the resources necessary for the survival and maintenance of their way of life. Ethnographic resources include plants and animals, ceremonial sites, tribal historic sites, and areas of sacred geography possessing mythic/spiritual significance. Over a period of many years (approximately 2008 – 2018) the WPAFB Cultural Resources Manager (CRM) worked to identify the federally-recognized Native American tribes with an interest in cultural resource preservation at WPAFB, specify the types of projects each tribe desired notification for, and develop and update an *Installation Tribal Relations Plan* (ITRP) outlining government-to-government consultation practices. The ITRP was signed on March 14, 2016, by the designated AF government-to-government points of contact for tribal affairs: the Installation Tribal Liaison Officer (Chief, Environmental Branch) and the Commander Designated Installation Representative (Director, 88th Civil Engineer Group) (WPAFB, 2017). Since the original ITRP was signed in 2016, the 88 Civil Engineer Group (CEG)/Civil, Environmental and Instructure Engineering (CEIE) conducts an annual update call with the Tribal signatories. This is the means of communication that the tribal POCs have requested. There have been only small modifications made to the ITRP over those years, but none that have warranted a new ITRP.

In 2002, Gray and Pape Inc. conducted a Phase I archeological survey of 309.04 acres across WPAFB, of which a portion of the acreage of the Hilltop and Gerlaugh Farm Parcels was included. It was concluded that all the areas had undergone widespread development and had a low probability of yielding prehistoric resources. These results were discussed with the five federally recognized tribes that were a part of the base's initial Tribal Consultation Meeting in May of 2016, and no levels of tribal interest in these areas were recorded in that or subsequent consultations. The federally recognized tribes are provided an opportunity to suggest any changes to the ITRP at the annual teleconference, the last of which was held November 28, 2023. There has been no change from their preference to only be consulted on matters involving two Indian burial mound sites or undisturbed soil adjacent to those sites.

3.6.2 Affected Environment

WPAFB owns over 250 historic buildings, several that are individually eligible for inclusion on the NRHP and most of which are located in one of three NRHP-eligible historic districts. The Integrated Cultural Resources Management Plan (ICRMP) for WPAFB identifies cultural resources listed in or eligible for the NRHP and/or listed on the WPAFB historic building list

(WPAFB, 2022c). Figure 3-4 shows NRHP-eligible buildings and districts within WPAFB Area B. The Wright Field Historic District comprises most of the western half of Area B (approximately one-half mile west of the proposed Hilltop Parcel, and across the Colonel Glenn Highway from the proposed Gerlaugh Farm Parcel) and several NRHP-eligible buildings are present in Area B.

F/20620 is an individually eligible building that is part of the AFRL headquarters campus approximately 400 feet south of the proposed Hilltop Parcel. F/20653 (circa 1967) is another individually eligible NRHP structure located approximately 1,500 feet west of the proposed Hilltop Parcel. The structure is a Cold War significant building in the existing AFRL research complex.

Archeological resource surveys have not revealed any sites within the Wright Field District eligible for listing in the NRHP (WPAFB, 2022b). Site 33 GR 31 (located about 1,200 feet northwest of the proposed Hilltop Parcel), identified as a single mound, located within a gated hilltop area on DAF land acquired in the 1940s during expansion associated with World War II mobilization, has been listed on the NRHP since the 1970s. A Phase I survey conducted in the fall of 2001 divided 309 WPAFB acres into 12 work areas to identify prehistoric resources and the degree of disturbance caused by Base development. The survey concluded all 12 areas had undergone widespread development and had a low probability of yielding prehistoric resources. Site 33-GR-1171 was determined to be located near the northwest corner of the proposed Hilltop Parcel within Work Area Q. Following the survey, it was determined that the site lacked research potential because of the light density of cultural remains. The site was recommended as not eligible for the NRHP and the SHPO concurred (WPAFB, 2021a). WPAFB contains no traditional cultural properties or sacred sites as defined by a federally recognized tribe or tribal leader.

Historically, much of the proposed Gerlaugh Farm Parcel was cleared and used for agricultural purposes with residents present on the property (the “Gerlaugh Farm”). Historical reports of a cemetery on the property, including a note on United States Geological Survey topographic maps beginning in 1955, prompted WPAFB to conduct an investigation in November 2020, completing a pedestrian inventory, magnetic gradiometry and ground-penetrating radar surveys (National Park Service/Midwest Archaeological Center, 2021). Although the surveys identified 15 possible headstones and numerous subsurface anomalies, nothing specifically characteristic of burials or a cemetery were identified. Further investigation of historical records indicated several Gerlaugh family members were interred at other nearby cemeteries, and the subsurface anomalies were likely remnants of the Gerlaugh family farmstead rather than a cemetery. While it is likely that the parcel does contain several graves/burials, they may have been impacted by subsequent site grading and landscaping. The potential presence of a large, organized cemetery is inconclusive at best.

3.6.3 Environmental Consequences

Adverse impacts on cultural resources might include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

3.6.3.1 Proposed Action

In consultation with the SHPO, WPAFB identified each proposed EUL parcel as APEs. WPAFB observed that the proposed Hilltop Parcel is an existing open space currently used as a walking track for base personnel with no structures eligible for listing on the NRHP. The site is near the prehistoric resource survey site 33-GR-1171, which was previously determined by WPAFB with concurrence by the SHPO to be ineligible for listing on the NRHP. Most of the proposed Hilltop Parcel has been previously disturbed, and other NRHP-eligible buildings in Area B would not be directly impacted by the proposed EUL construction and operation.

The proposed Gerlaugh Farm Parcel is also an existing open space adjacent to the northeast of the existing Mission Point Office Park development. Most of the site has been previously disturbed and there are no existing NRHP eligible structures present on the property. Investigation of historical reports of a potential cemetery on the site were inconclusive and although there could be several graves/burials present on site, there does not appear to have been a large, organized cemetery. In the event of an unanticipated discovery of possible grave sites or other archaeological resources, actions detailed in the ICRMP would be initiated to minimize impacts (WPAFB, 2022c).

Based on these conditions, WPAFB concluded that there would be no adverse effect to historic properties by the proposed EUL developments. WPAFB submitted a description of the proposed EUL project and determination to the SHPO on November 24, 2023, which concluded that there would be no adverse effect to historic properties by the proposed development. The SHPO responded in a letter dated January 3, 2024 (Appendix A) and concurred that the proposed action would have no adverse effect on historic properties.

As outlined in the ITRP, the federally recognized Native American tribes typically consulted for EAs conducted at WPAFB (Keweenaw Bay Indian Community, Sac and Fox of the Mississippi in Iowa, Saginaw Chippewa Indian Tribe, Oklahoma Seneca Cayuga Nation, and Seneca Nation of Indians) only request notification when an action involves ground disturbance or when construction on-Base involves areas of previously undisturbed ground. Since the proposed EUL development project areas are considered to be located in an area of previous ground

disturbance, consultation with the above-referenced federally recognized Native American tribes is not required.

There would be no short-term or long-term adverse effects to cultural resources at either EUL parcel because no archaeological sites or NRHP eligible buildings are located in close proximity to the proposed EUL sites and there is little chance of any archaeological resources existing within either EUL parcel due to previous ground disturbance. In the event of an unanticipated discovery of possible grave sites or other archaeological resources, actions detailed in the ICRMP would be taken to minimize impacts. Work would be stopped immediately and the WPAFB CRM would be notified of the nature and location of the discovery. Efforts would be taken to ensure protection of the resources until the arrival of the CRM (WPAFB, 2022c).

3.6.3.2 No Action Alternative

Under the No Action Alternative, the proposed EUL Development projects would not be constructed at WPAFB, and existing conditions would remain the same. No adverse effects on historic properties or cultural resources would occur.

3.6.4 Cumulative Impacts

There were no short-term or long-term adverse effects on cultural resources identified at the EUL parcels. Therefore, there would be no cumulative impacts to cultural resources attributable to these sites.

3.7 Biological/Natural Resources

Biological resources include native or naturalized plants and animals, and the habitats, such as wetlands, forests, and grasslands, in which they exist. This section describes the biological resources at WPAFB.

3.7.1 Regulatory Setting

In accordance with DoD and DAF directives, instructions, and policies, WPAFB has prepared and implemented an Integrated Natural Resources Management Plan (INRMP) that details how natural resources are protected and managed at the base. The INRMP is updated on a regular schedule and coordinated with and concurred by the USFWS and ODNR. The current version is dated 2022 – 2026 (WPAFB, 2022d).

Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the USFWS under the Endangered Species Act (ESA) (16 USC 1531 *et seq.*), or a state. Under Section 7 of the ESA and regulations implementing this section, federal agencies must, in consultation with the USFWS and/or National Marine Fisheries Service, as applicable, ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in

the destruction or adverse modification of critical habitat. In addition, the ESA prohibits the unauthorized "take" of any endangered or threatened species. In Ohio, the ODNR, Division of Wildlife may restrict the taking or possession of native wildlife threatened with statewide extirpation and maintains a list of endangered animal species (Ohio Revised Code [ORC] 1531.25) and the Division of Natural Areas and Preserves maintains a list of plant species protected under ORC Chapter 1518 (ORC 1518.01). In addition, AFMAN 32-7003 provides that INRMPs should provide for the protection and conservation of state-listed protected species when practicable and consistent with the military mission. The *Endangered Species Management Plan* (BHE Environmental, Inc. [BHE], 2001), which has been incorporated into the INRMP, provides species-specific protection and conservation measures to protect known special status species occurring on the Base (WPAFB, 2022d).

3.7.2 Affected Environment

The affected environment at WPAFB primarily consists of three categories: vegetation, wildlife, and threatened and endangered species as described in the following sections.

3.7.2.1 Vegetation

Natural vegetative communities on WPAFB can be divided into five general categories: forest/woodlands (709 acres), prairie (109 acres), old fields (388 acres), wetlands (23 acres), and maintained areas that are routinely mowed (e.g., airfields, parks, roadsides, and golf courses) and other developed areas such as parking lots, residential lawns, and other green space between buildings.

The proposed Hilltop Parcel is located on the eastern border of WPAFB Area B along National Road. The site is currently maintained open space with lighted walking trails. Site vegetation is maintained lawn with occasional street trees located on the northern portion of the property.

The proposed Gerlaugh Farm Parcel is located on the southern border of WPAFB Area B across Colonel Glenn Highway from the Area B Airfield and east of the Properties at Wright Field – WPAFB privatized residential development. Historically the site was used for agricultural purposes until 1942 when the property was deeded to the DAF. The western portion of the Gerlaugh Farm site (the area of proposed EUL development) consists primarily of maintained lawn. Semicircles of landscaped vegetation are located around the site entrance onto Mission Point Boulevard off the Colonel Glenn Highway. The mowed lawn ends near the western and southwestern border of the site and is replaced by scrub vegetation and planted ornamental trees as a visual screen between the Gerlaugh Farm site and the small Center Point Energy Maintenance facility to the south, and residential/commercial property to the west. The eastern portion of the site, though historically mowed, has been allowed to revegetate naturally and contains brush, overgrown mixed vegetation and young trees.

3.7.2.2 Wildlife

WPAFB is home to a diverse variety of wildlife. Many animals are only present at WPAFB for a short period while migrating between winter and summer habitats, while others are year-round residents. Previously conducted surveys documented the presence of 38 species of mammals, 140 bird species, 12 reptile species, and 9 amphibian species on the Base (WPAFB, 2022d). Areas of the Base associated with the Proposed Action are located within previously disturbed areas and species occurring in such areas are common species to the Base.

There are no known sensitive habitats or protected areas in close proximity to the proposed EUL sites. According to the WPAFB INRMP, the Huffman Prairie, a 109-acre sensitive and protected area, is located in Area A and is greater than one mile from either of the EUL project areas.

3.7.2.3 Threatened and Endangered Species

Protected wildlife and plant species by the ODNR and the USFWS known to occur or known to have occurred on WPAFB are included in Table 3-4. The occurrence of habitat for threatened and endangered species in the general vicinity of the proposed EUL sites is indicated in Figure 3-5. Consultation with the ODNR (see Appendix A) also identified several state-listed species within one-mile of the project site (but not necessarily on WPAFB).

WPAFB actively manages for three federally listed species (Indiana bat, northern long-eared bat, and eastern massasauga). No critical habitat has been designated (as defined in the ESA) on WPAFB for any federally listed species. WPAFB also manages for four additional species listed in Ohio as endangered (WPAFB, 2022d). Most other threatened or endangered species potentially present or actively managed at WPAFB are located in Area A, remote from the proposed EUL sites.

3.7.3 Environmental Consequences

Biological resources that would potentially be impacted by the proposed project include vegetation, wildlife, and threatened and endangered species. Evaluation criteria for impacts on biological resources are based on:

- Importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;
- Proportion of the resource that would be affected relative to its occurrence in the region;
- Sensitivity of the resource to the proposed activities; and
- Duration of ecological ramifications.

The impacts on biological resources would be adverse if species or habitats of high concern are negatively 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.

3.7.3.1 Proposed Action

Potential impacts to vegetation, wildlife, and threatened and endangered species are described in the following sections.

Vegetation

At full buildout, the proposed Hilltop EUL Development would convert 15.8 acres of the total 22 acres (69%) of existing vegetation (maintained mowed lawn and occasional sparse trees) to impervious surfaces (parking lot, buildings). At full buildout, the proposed Gerlaugh Farm EUL Development would convert 7.7 acres of the 22 acres (33.4%) of the 22-acre site of existing vegetation (mowed lawn, scrub vegetation and trees) to impervious surfaces (parking lot, buildings). Disturbed areas on the proposed EUL project sites would be re-vegetated as needed. In accordance with WPAFB policy, any trees removed at either proposed EUL site would be replaced at a 3-to-1 ratio. Of the 8,145 acres on WPAFB, 2,000 acres consists of undeveloped land with natural constraints composed of forests/woodlands (709 acres), prairie (109 acres), fields/grasslands (388 acres), wetlands (23 acres) and mowed areas consisting of airfields, parks and golf courses (771 acres). Compared with the 2,000 acres of undeveloped land, the 23.5 acres of converted land to impervious surfaces results in 1.2% reduction of existing vegetation across the base, which would not be a significant impact to vegetation.

Wildlife

The proposed EUL development sites at the Hilltop and Gerlaugh Farm Parcels are not located near any sensitive wildlife habitat identified at WPAFB. According to the WPAFB INRMP, the Huffman Prairie, a 109-acre sensitive and protected area, is located in Area A and is greater than one mile north from either of the EUL project areas.

Wildlife at the proposed Hilltop EUL Development site would be limited to burrowing mammals and squirrels, and common songbirds that typically inhabit open space consisting of mowed lawns with occasional trees. At full buildout, construction and operation of the proposed EUL Development would represent a substantial, nearly complete loss of that existing wildlife habitat with 69% (15.8 acres) of 23 acres total converted to impervious surfaces. Existing wildlife would presumably relocate to other nearby similar habitat on- or off-base.

Similar wildlife inhabiting the maintained mowed lawns at the proposed Gerlaugh Farm EUL Development site would also be fully displaced by the proposed construction and operation. Other wildlife types may inhabit the scrub vegetation and small trees present on the eastern and southeastern portions of the site and along the small stream that crosses the Gerlaugh Farm site

through those areas. That habitat would not be lost directly to construction but may be indirectly impacted by construction and operational activities resulting in noise and traffic.

Threatened and Endangered Species

As shown on Figure 3-5, no known occurrences or habitat of threatened or endangered species have been identified on or near the proposed Hilltop and Gerlaugh Farm Parcels. Consultation letters were submitted to the USFWS and ODNR for the proposed EUL projects on November 29, 2023 as documented in Appendix A. The USFWS responded on December 13, 2023 that they had reviewed the DAF's project description and concurred with the determination that the project, as proposed, is not likely to adversely affect the federally endangered Indiana bat (*Myotis sodalis*) and the northern long-eared bat *(Myotis septentrionalis*). This concurrence is based on the commitment to cut all trees greater than or equal to 3 inches in diameter at breast height only between October 1 and March 31. The ODNR responded on January 12, 2024 and indicated that the entire state of Ohio is in the range of the Indiana bat (*Myotis sodalis*), a state and federally-endangered species; the northern long-eared bat *(Myotis septentrionalis*), a state and federally-endangered species; the little brown bat (*Myotis lucifugus*), a state endangered species; and the tricolored bat (*Perimyotis subflavus*), a state endangered species. Furthermore, the ODNR recommended that tree cutting only occur from October 1 through March 31 conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with diameter at breast height greater than or equal to 20 inches as much as possible. The ODNR concluded that these projects were not likely to impact the state threatened and endangered species described in their letter (Appendix A).

Prior to tree removal, the WPAFB Natural Resources Manager would identify and mark the trees that meet the above criteria for trees greater than or equal to 3 inches in diameter at breast height. The developer would be responsible for adhering to tree removal in accordance with the INRMP (WPAFB, 2022d) and ensuring that trees are cut only between October 1 and March 31 as described above. The trees would be replaced under the supervision of the WPAFB Natural Resources Program Manager and in accordance with WPAFB Installation Facility Standard, Section GO3.10.3 (WPAFB, 2023a).

3.7.3.2 No Action Alternative

Under the No Action Alternative, no new construction or operation would be conducted on the Hilltop Parcel or the Gerlaugh Farm Parcel and existing conditions, as described in Section 3.6.2 would remain the same. The proposed EUL parcels would remain open space as at present. There would be no soil alteration or disturbance of vegetation, wildlife habitat or the perennial stream from construction, excavation, grading, or fill activities. Therefore, there would be no short- or long-term impacts because there would be no change to existing biological resources over baseline conditions.

3.7.4 Cumulative Impacts

Construction activities associated with the Proposed Action and cumulative projects listed in Table 3-1 would not adversely affect biological resources because construction and/or renovation projects are located within previously-developed and/or disturbed areas.

3.8 Earth Resources

The earth resources at WPAFB and each EUL parcel are described in the following sections.

3.8.1 Regulatory Setting

Geological resources consist of the earth's surface and subsurface materials. Topography pertains to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Geology is the study of the earth's composition and provides information on the structure and configuration of surface and subsurface features. Hydrogeology extends the study of the subsurface to water-bearing structures. Hydrogeological information helps in the assessment of groundwater quality and quantity and its movement.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses.

3.8.2 Affected Environment

Topography, geology, natural hazards, and soils are described in the following sections.

3.8.2.1 Topography and Geology

The majority of the Base is on the broad alluvial plain of the Mad River Valley, which overlies Ordovician-age Richmond shale and limestone bedrock. The land surface elevation on Base ranges from approximately 760 to 980 feet above mean sea level (MSL) (WPAFB, 2022d).

The Base is within the glaciated till plain region of southwestern Ohio, an area within the Central Lowlands Physiographic Province. The Central Lowlands province is characterized by low rolling hills, level plains, and flat alluvial valleys.

Land surface at the Hilltop Parcel is generally flat on the southern portion of the property, and the surface dips slightly to the north-northwest. The mean surface elevation is approximately 967 feet above mean sea level (AMSL) (WPAFB, 2021a).

Land surface at the Gerlaugh Farm Parcel is also generally flat with a surface elevation of approximately 854 feet AMSL (WPAFB, 2021b).

3.8.2.2 Natural Hazards

The state of Ohio is characterized by a low level of seismic activity (ODNR, 2017). The Dayton, Ohio, area does not typically experience earthquakes because of its location in relation to fault zones (Hansen, 2015). Auglaize and Shelby counties located in northwest Ohio (approximately 45 miles from Greene County) had a series of historic earthquakes in the late 1800s to mid-1900s, with the greatest instrumented magnitude recorded between 5.0 and 5.4 (Hansen, 2015). On July 23, 2010, a 5.0 magnitude earthquake originating along the Quebec-Ontario border was felt in Dayton and surrounding areas.

3.8.2.3 Soils

Surface soil at WPAFB formed on unconsolidated deposits, primarily alluvium, glacial outwash, glacial till, and loess (WPAFB, 2022d). Development and substantial earthmoving activities have altered the natural soil characteristics at WPAFB, making precise classifications difficult. The USDA Natural Resources Conservation Service (NRCS) mapped most of WPAFB as urban land complexes.

Forty soil mapping units occur on WPAFB. Warsaw-Fill land complex is the most common soil unit on Base and occurs on 1,326 acres. This soil is found in the northeast portions of the Base. The second most common soil occurring on the Base is the Sloan-Fill land complex. This soil is found in the northern portions of the Base and covers approximately 1,232 acres. Approximately one-half of the soils on Base have a moderate to high potential for erosion. The potential for erosion varies with topographic conditions and includes both disturbed urban land complex soils and natural loams. Bare soil leads to erosion, creation of gullies and rills, and increased sediment load in streams. Erosion can render land unsuitable for training and impassable by vehicles. Sediment in streams may affect water flow and the survival of aquatic organisms.

According to the NRCS Soil Survey, soil at the proposed Hilltop Parcel consists of Miamian Silt and Clay Loam (MhC2) and Miamian-Urban land complex (MrB). Miamian Silt and Clay Loam is well-drained soil made up of fine-grained silt and clay materials within the top 60 inches and is considered within Class C hydrologic group containing slow infiltration rates (WPAFB, 2021a).

The southern portion of the Hilltop Parcel contains EFDZ 5, characterized as part of the Remedial Investigation of Operable Unit 9 (Information Technology [IT], 1997). The EFDZ was identified as an IRP site because of its potential for past disposal of hazardous chemical materials during or subsequent to fill placement. (WPAFB 2021a). EFDZ 5 is characterized further in Section 3.10.2.

3.8.3 Environmental Consequences

Soil at the proposed Gerlaugh Farm Parcel is predominantly Ragsdale silty clay loam (Ra) and Miamian silt loam (MhC2). The Ragsdale silty clay loam consists of very deep poorly drained soils within the top 80 inches. The Miamian silt loam is well-drained soil made up of fine-grained silt and clay materials within the top 60 inches. Both are considered within the Class C hydrologic group containing slow infiltration rates. (WPAFB, 2021b). The NRCS classifies the Ra soil type as "prime farmland if drained" and the MhC2 soil type as "farmland of local importance." Historically the Gerlaugh Farm site was in agricultural use from at least 1936 to approximately 1942. According to WPAFB real estate records, the farm was deeded to the DAF in 1942 and not farmed since its transfer (see Section 3.3.3).

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be adverse if the action alters the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure or function within the environment.

3.8.3.1 Proposed Action

Both the Hilltop and the Gerlaugh Farm Parcels are relatively flat and thus do not present unusual issues with slopes requiring special engineering and construction techniques to maintain stability and prevent erosion. Both sites would require extensive site preparation and excavation for installation of building foundations, subsurface utilities, and parking. Excess soils would be stockpiled with erosion and sediment controls until transport off-site for disposal. Standard erosion and sediment controls would be implemented during construction to prevent site soils from entering site stormwater drainage. Soil erosion would be minimized during construction activities using Best Management Practices (BMPs) in accordance with the Phase I National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit.

Neither site presents any known unique geological features or hazards that would require special engineering or construction measures, and the types of proposed construction (primarily new office buildings) would be constructed using typical engineering designs and construction techniques commonly used in the industry. At full buildout, additional impervious surface would replace existing soil and reduce the amount of precipitation infiltration to subsurface aquifers. This impact on groundwater is analyzed in Section 3.8.3.1. Site preparation and excavation on

EFDZ 5 at the Hilltop Parcel would need to be conducted in accordance with Ohio EPA requirements (see Section 3.10 Hazardous Materials/Waste).

As stated in Section 3.7.2, two soil types at the Gerlaugh Farm Parcel, Ra and MhC2, are classified as "prime farmland if drained" and "farmland of local importance", respectively. WPAFB contacted the USDA NRCS office in Xenia, Ohio and submitted Form AD-1006, Farmland Conversion Impact Rating for evaluation on June 18, 2024 (Appendix A). The NRCS concurred that the proposed conversion at the Gerlaugh Farm Parcel is not subject to the provisions of the Farmland Protection Policy Act.

In the short term, construction vehicles would disturb the surface and create the potential for soil erosion and sedimentation. Limited, short-term impacts would be minimized by implementing standard construction practices to control erosion and sedimentation. There would be no long-term adverse impacts due to erosion and sedimentation because the disturbed areas would either be covered by buildings and parking lots or restored with vegetative cover.

3.8.3.2 No Action Alternative

Under the No Action Alternative, no new construction or operation would be conducted on the Hilltop Parcel or the Gerlaugh Farm Parcel and existing conditions, as described in Section 3.7.2 would remain the same. The proposed EUL parcels would remain open space as at present. There would be no soil alteration or disturbance of soil or vegetation from construction, excavation, grading, or fill activities. Therefore, there would be no short- or long-term impacts because there would be no change to existing soils over baseline conditions.

3.8.4 Cumulative Impacts

Construction activities associated with the Proposed Action and cumulative actions related to the MILCON and demolition projects listed in Table 3-1 would result in temporary disturbed ground surfaces and short-term adverse impacts on earth resources. Although soils would be disturbed by earthmoving and other construction activities, any effects would not be expected to exceed individual project boundaries and/or result in significant impacts on earth resources because BMPs, erosion, and sediment controls and other management measures would be implemented. In addition, paved surfaces associated with the Proposed Action and cumulative actions related to the MILCON and demolition projects listed in Table 3-1 would result in some cumulative long-term impacts to soils. Cumulative long-term impacts to soils would be insignificant because disturbed surfaces at each site that are not paved would be restored with vegetative cover. In addition, the cumulative increases in impervious surfaces would be minor in relation to areas restored with vegetative cover and remaining unpaved areas in the vicinity of the proposed EUL project sites.

3.9 Water Resources

Water resources at WPAFB include groundwater, surface water, wetlands, and floodplains and are described in the sections below.

3.9.1 Regulatory Setting

Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes. Specific regulations are covered in each of the sections below.

3.9.1.1 Groundwater

Groundwater consists of the subsurface hydrologic resources and is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate. Groundwater resources are regulated by the USEPA and Ohio EPA as described in Section 3.8.2.

3.9.1.2 Surface Water

Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale, and is regulated directly under the federal Clean Water Act (CWA), and in many cases under state and/or local regulatory authorities. Point source discharges from sewage treatment plants and industrial sources to waters of the United States require permits under the NPDES to limit discharge of contaminants to levels acceptable for public health and the environment. Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade water quality in lakes, rivers, and streams. Storm water flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, parking lots, and airfields, are important to the management of surface water. Storm water drainage systems convey precipitation away from developed sites to appropriate receiving surface waters. Higher densities of development require greater degrees of storm water management to mitigate both increases in storm water quantity and decreases in storm water quality. The USEPA has developed Storm Water NPDES General Permits for construction, industrial activity, and municipal separate storm sewer systems (MS4) to protect surface water quality from storm water discharges. In Ohio, permits are implemented by Ohio EPA. WPAFB and local governments such as Greene County and the city of Beavercreek have obtained coverage under the Storm Water NPDES MS4 General Permit, and the local governments have established their own permit programs to control storm water discharges into their MS4 systems.

The Greene County Engineer's Office is responsible for storm water management and compliance in unincorporated areas (Small MS4 general permit under the Ohio EPA Storm

Water regulations program) on behalf of the Greene County Commissioners, as well as Bath, Beavercreek, Sugarcreek and Xenia Townships. The Greene County Engineer's Office coordinates activities among the various stakeholders, providing support for each of the Minimum Control Measures (MCMs) outlined in the Ohio EPA's NPDES MS4 Permit.

The city of Beavercreek has also enacted a comprehensive Storm Water Management ordinance. The ordinance requires preparation, submittal and approval of a Storm Water Management Plan ("SMP") to prevent erosion and sedimentation during construction, and to safely convey and temporarily store and release post-development storm water runoff at an allowable rate to minimize flooding and erosion.

Storm water runoff in urban areas is one of the leading sources of water pollution in the U.S. (USEPA, 2018). In December 2007, Congress enacted the Energy Independence and Security Act (EISA) establishing strict storm water runoff requirements for federal development and redevelopment projects. Section 438 of EISA requires federal agencies to develop and redevelop facilities with a footprint that exceeds 5,000 square feet in a manner that maintains or restores the pre-development site hydrology to the maximum extent technically feasible. Federal agencies can comply using a variety of storm water management practices often referred to as "green infrastructure" or "low impact development" practices, including reducing impervious surfaces and using vegetative practices, porous pavements, cisterns, and green roofs (USEPA, 2018).

3.9.1.3 Wetlands

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat detention, and erosion protection. Wetlands that meet the definition of "waters of the United States" (33 CFR 328.3) are regulated under Section 404 of the Clean Water Act (CWA) and implementing regulations. The U.S. Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328.3(c)(1)). Discharge of dredged or fill material into waters of the Unites States, including wetlands, are subject to permit approval by the USACE with accompanying water quality certification from Ohio EPA.

EO 11990, *Protection of Wetlands*, May 24, 1977, directs that federal agencies, to the extent permitted by law, avoid undertaking or providing assistance for new construction located in wetlands unless the agency finds that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize harm to wetlands that may result for use.

3.9.1.4 Floodplains

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters and might be subject to periodic or infrequent inundation due to rain or melting snow. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as the area that has a one percent chance of inundation by a flood event in a given year.

EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain and typically involves consultation of appropriate FEMA Flood Insurance Rate Maps. EO 11988 provides requirements to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. AFMAN 32-7003 provides more detailed requirements for proposed actions that will occur in or could adversely affect floodplains.

The MCD was established to provide flood control, conservation, and watershed management in the Miami River Watershed. The MCD constructed and operates five dams in the watershed for flood control in the Dayton region, including the Huffman Dam on the northwest side of WPAFB. The MCD through the *Land Use Agreement* (dated January 7, 2000) and the MCD *Policy and Procedure for Permits in Retarding Basins* regulates all construction on land within the Huffman Dam Retarding Basin and more than 5 feet below the spillway elevation of 835 feet above MSL. All construction activities in the floodplain- or retarding basin must be coordinated with the MCD for approval.

3.9.2 Affected Environment

The affected environment for water resources are described on a regional level as well as for WPAFB specifically.

3.9.2.1 Groundwater

WPAFB is located in the Great Miami River Valley, which is filled with glacial deposits of sand and gravel. The glacial outwash deposits are very permeable and exhibit high transmissivity and hydraulic conductivity. The Miami Valley Buried Aquifer system is a highly productive source of water for the millions of people in southwest Ohio. The USEPA designated a portion of the Buried Valley Aquifer System of the Great Miami/Little Miami River Basins of Southwestern Ohio (BVAS) as a sole-source aquifer in 1988, requiring USEPA Region 5 approval on federally-assisted projects constructed in the area to ensure continued use as a drinking water supply (53 Federal Register 15876). The buried aquifer system provides drinking water for more than 1.6 million people in southwest Ohio (Debrewer, et.al, 2000).

Most of the wells in the outwash deposits yield between 750 and 1,500 gpm but can vary from less than 200 to more than 4,000 gpm (WPAFB, 1995b). The city of Dayton groundwater production wells at Huffman Dam are screened at depths of over 100 feet below ground surface.

The buried valley aquifers coincide with the Great Miami River and its tributaries. Water underground generally follows the same flows as surface waters with upland areas serving as recharge areas and groundwater divides (MCD, 2002). At WPAFB, the Mad River follows the course of the Mad River Buried Aquifer, part of the BVAS. Groundwater flow in the area of Hilltop Campus is expected to flow generally northwest toward the Mad River located approximately one mile north. Groundwater flow in the area of Gerlaugh Farm is expected to flow generally west northwest toward the Mad River located approximately one mile west.

Potential sources of groundwater contamination may limit groundwater use, regardless of groundwater yield. Under its Environmental Restoration Program (ERP), WPAFB has grouped confirmed or suspected sites requiring investigation and characterization into 11 geographically-based operable units (OUs), designated as OUs 1 through 11. (Additional detail is provided in Section 3.10 Hazardous Materials/Waste.) Remedies for the IRP sites are documented in six Record of Decision (ROD) documents. The current and future land uses as agreed upon in these RODs between the U.S. EPA, Ohio EPA and WPAFB identify the land use controls (LUCs) necessary to support the remedial action or No Further Action decisions for industrial/recreational sites (WPAFB, 2019). Construction or earth disturbance in or within 300 feet of these designated sites requires submittal to and approval of a Rule 513 Application by Ohio EPA to prevent release of residual contaminants to the environment, including groundwater.

3.9.2.2 Surface Water

WPAFB is in the Mad River Valley. The Mad River originates approximately 40 miles north of Springfield, Ohio, flows south and southwest past WPAFB to its confluence with the Great Miami River in Dayton, Ohio, and flows into the Ohio River. Sustained flow of the Mad River originates from groundwater discharge of glacial deposits upstream of Huffman Dam. The Mad River approaches WPAFB from the north and flows along the western border of Area A. The Ohio EPA has divided the Mad River watershed into five areas:

- Headwaters
- Mad River between Kings and Chapman Creeks
- Buck Creek
- Mad River from Chapman to Mud Creeks
- The lower Mad River (Mud Creek to the Great Miami River).

Mud Creek enters the Mad River 2,000 feet north of the state Route 235 bridge, near the northwest corner of Area A. The Base lies adjacent to the northernmost portion of the lower Mad River segment.

The Ohio EPA has identified the lower segment of the Mad River, which flows through WPAFB, as an impaired water under Section 303(d) of the CWA for not meeting aquatic life and recreation use standards (Ohio EPA, 2010).

The USEPA has established the total maximum daily load (TMDL) of effluent to the Mad River in the *Mad River Total Maximum Daily Loads for Sediment and Turbidity* (USEPA, 2010). A TMDL specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards and allocates pollutant loadings among point and nonpoint pollutant sources. The TMDL for the Mad River watershed has been set at 120 percent of natural sediment loading. According to the report, the natural sediment loading in the basin is approximately 894 tons/square mile/year based on an annual average.

The WPAFB *Storm Water Management Plan* (SWMP) and the *Storm Water Pollution Prevention Plan* (SWPPP) (prepared to comply with the CWA and the Ohio Water Pollution Control Act) provides descriptions of storm drainage areas and their associated outfalls, potential storm water pollution sources, and material management approaches to reduce potential storm water contamination (WPAFB, 2021c). The SWMP covers all areas and non-industrial activities within the limits of WPAFB and was last updated in July 2021. Storm water protection for industrial activities is covered in the SWPPP, which was last updated in September 2021 (WPAFB, 2021d).

The SWMP addresses the specific storm water management requirements of municipal NPDES General Permit No. OHQ000004 (WPAFB, 2021c), while the SWPPP addresses the requirements of the industrial NPDES Permit No. IO00001*JD (WPAFB, 2021b). The current version of this permit is IO00001*GB (the two-letter suffix changes with each renewal of the permit).

The SWPPP and SWMP provide specific BMPs to prevent surface water contamination from activities such as construction, storing and transferring of fuels, storage of coal, storage and use of lubrication oils and maintenance fluids, solid and hazardous waste management, and use of deicing chemicals. Implementation of the following BMPs reduces the likelihood of pollutants entering the WPAFB storm system from construction activities: silt fences, sediment basins, rock check dams, temporary seeding, storm drain inlet protection, and dust control.

There are 20 defined drainage or “Outfall Areas” and 23 NPDES discharge monitoring points on Base that are addressed under the NPDES permit (WPAFB, 2021d). All storm water from

WPAFB flows into the Mad River. Surface water in the WPAFB area includes the Mad River, Trout Creek, Hebble Creek, Twin Lakes, Gravel Lake, and wetland areas. These surface water features are recharged by both precipitation and groundwater. Trout Creek and Hebble Creek provide drainage of surface water runoff at WPAFB.

The surface water features within Area B consist of man-made ditches and ponds, and concrete-lined channels. Storm drainage exits Area B by several paths through a combination of surface drainage and storm drains that ultimately drain to the Mad River.

Storm water drainage in developed portions of Area B is generally collected in storm sewers and conveyed to NPDES Outfalls 001 – 005. Storm water quality is periodically monitored by sampling and analysis at outfalls designated in WPAFB's Storm Water Management Plan. Storm water drainage in less developed areas may drain as overland sheet flow to low points that allow infiltration and/or function as wetlands.

3.9.2.3 Wetlands

Wetlands located in the proposed project area are shown in Figure 3-5. A thorough base-wide wetland survey was conducted in June and July of 2004 and documented in the 2005 Wetland Management Plan (BHE, 2005). Seventeen wetlands are located in Area B at WPAFB. All wetlands in Area B are located in developed areas. The wetlands exist in proximity to a high level of human activity, and several are components of storm water management. Four of the wetlands, located approximately 1,000 feet north of the Gerlaugh Farm Parcel, formed on a slope east of Area B's inactive airfield. Underground drainage features or seeps may have led to the formation of these four small wetlands. The wetlands in the vicinity of the project area are of generally low quality due to their proximity to human activities.

3.9.2.4 Floodplains

A large portion of WPAFB and most of Area A lies within the Mad River floodplain. The 100-year floodplain is at 813.4 feet above MSL as calculated using the North American Vertical Datum of 1988 (National Geodetic Survey [NGS] 2017. Area B is classified as Zone X by FEMA, which is an area of minimal flood hazard outside the 500-year floodplain with less than a 0.2 percent chance of an annual flood.

3.9.3 Environmental Consequences

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. Impacts would be adverse if proposed activities result in one or more of the following:

- Reduces water availability or supply to existing users
- Overdrafts groundwater basins

- Exceeds safe annual yield of water supply sources
- Affects water quality adversely
- Endangers public health by creating or worsening health hazard conditions
- Threatens or damages unique hydrologic characteristics
- Violates established laws or regulations adopted to protect water resources

3.9.3.1 Proposed Action

Potential impacts to water resources are described in the following sections.

3.9.3.2 Groundwater

Construction and operation of the proposed mixed-use and office developments on the Hilltop Parcel and the Gerlaugh Farm Parcel would not result in new groundwater withdrawals, so would not affect groundwater supplies (yield) directly. At full buildout, the proposed Mixed-Use/Office Development at the Hilltop Parcel would result in conversion of approximately 15.8 of the total 22-acre site from pervious to impervious surface. Although the existing parcel is largely mowed and maintained vegetated open space, the site does contain some existing storm drainage. As described below, that drainage diverts precipitation to downstream surface water flow, while another portion of site precipitation infiltrates the subsurface and adds to local aquifer recharge. With the new development, impervious surface would increase with a corresponding increase in storm water runoff and reduction in groundwater recharge. That reduction may be offset by infiltration provided in the site's storm water management system, but that amount would depend on final design details. In any case, the reduction in groundwater recharge would be insignificant in the context of the watershed and associated aquifer.

Approximately half the proposed Hilltop Parcel facilities are within earth fill disposal zone (EFDZ) 5, part of IRP Operable Unit (OU) 9. Bis(2-ethylhexyl) phthalate exceeded Maximum Contaminant Levels (MCLs) and Preliminary Remediation Goals (PRGs), and arsenic exceeded the PRG in groundwater in EFDZ 5 groundwater during site investigations in the late 1980s and 1990s. Additional detail is provided in Section 3.10.3.1 under Environmental Restoration Program.

At the Gerlaugh Farm Parcel, the proposed Office Development would result in conversion of approximately 7.7 acres of the total 23-acre site from pervious to impervious surface, increasing storm water drainage and reducing groundwater recharge. That reduction may be partially offset by infiltration provided in the developed site's storm water management system depending on final design details. The reduction in groundwater recharge would be insignificant in the context of the watershed and associated aquifer.

3.9.3.3 Surface Water

The proposed Hilltop EUL site is located in WPAFB NPDES Drainage Area 5. Existing storm water infrastructure on the Hilltop site collects runoff in yard drains and routes it via subsurface culverts across National Road where it enters surface drainage on private property. This drainage flows north where it crosses back onto WPAFB Area B property and is eventually discharged via NPDES Outfall 005. Thus, storm water runoff from the new Mixed-Use/Office Development would still be subject to regular monitoring as conducted under WPAFB's existing NPDES permit and SWMP at Outfall 005. At full buildout, the proposed Mixed-Use/Office Development at the Hilltop Parcel would result in conversion of approximately 15.8 of the total 22-acre site from pervious to impervious surface. To comply with EISA, Ohio EPA and city of Beavercreek storm water management requirements, new storm water retention/detention basins would be constructed to maintain pre-development hydrology and provide suspended solids and oil and grease removal from the new parking facilities. Since the proposed development would be constructed in phases (see Section 2.4.1 and Table 2-2), the new storm water drainage and management facilities construction would also be phased accordingly. The proposed Gerlaugh Farm Parcel is south of the Area B airfield across the Colonel Glenn Highway, and site drainage is not part of the existing WPAFB storm water NPDES drainage. At full buildout, the proposed Gerlaugh Farm development would convert approximately 7.7 acres of the 22-acre site to new impervious area. To comply with EISA, Ohio EPA and city of Beavercreek storm water management requirements, new storm water retention/detention basins would be constructed to maintain pre-development hydrology and provide suspended solids and oil and grease removal from the new parking facilities. Since the proposed Gerlaugh Farm parcel would also be constructed in phases, the new storm water drainage and management facilities construction would also be phased accordingly.

During each phase of the proposed Hilltop and Gerlaugh Farm EUL construction, earth disturbance would exceed 1.0 acre, requiring preparation of a Construction SWPPP and obtaining coverage under the Ohio EPA Construction General Permit (CGP). Erosion and sediment control during construction would also be addressed as part of the city of Beavercreek storm water permit. The SWPPP would detail site-specific erosion prevention and sediment control measures to be implemented, inspected and maintained during construction. Each SWPPP and CGP would include any newly created temporary construction parking and laydown space. Newly created temporary construction laydown and parking areas would be removed and revegetated at the conclusion of construction or included in the overall permanent facility storm water management system design. BMPs included in the SWPPP (e.g., erosion control fence, haybales, inlet sediment filter protection, rock check dams, temporary seeding, storm drain inlet protection, and sediment basins) should prevent significant impacts to storm water quality during construction. The developer and their subcontractors would be responsible for obtaining the CGP. Copies of the permits would need to be provided to WPAFB.

Connection of the proposed Gerlaugh Farm EUL storm water management system would require connection to the existing site drainage swale/stream. WPAFB requested a preliminary jurisdiction determination (PJD) on February 22, 2024 and the USACE issued the PJD on April 26, 2024, indicating that at least 200 feet of the stream (SB6) was considered a non-wetland perennial stream subject to Section 404 of the CWA. Depending on design details, a Section 404 permit from the USACE and ODNR may be required. Depending on design details, coverage could likely be obtained under Nationwide Permit 7 (Outfall Structures), 39 (Commercial and Institutional Developments), or 43 (Stormwater Management Facilities) for Ohio. The developer would be responsible for compliance with USACE and ODNR permitting requirements.

3.9.3.4 Wetlands

As shown on Figure 3-5, no known wetlands have been identified on or near the proposed Hilltop and Gerlaugh Farm Parcels. The Gerlaugh Farm site does contain a perennial stream that conveys storm water drainage from the eastern portion of the site, from the I-675 and Loop Road interchange across the middle portion of the site to drainage on the north side of the Colonel Glenn Highway.

A PJD was received from the USACE – Huntington District on April 26, 2024, which determined one perennial stream (Stream SB6, 200 linear feet) is located within the PJD review area on the 22-acre site. The identified aquatic resources may be waters of the United States in accordance with the Regulatory Guidance Letter for JDs issued by USACE on October 31, 2016. For the purposes of determination of impacts, compensatory mitigation, and other resource protection measures, these aquatic resources would be evaluated as if they are waters of the United States. Section 404 of the Clean Water Act would require a Department of Army permit to be obtained prior to discharging dredged and/or fill material into waters of the Unites States. The developer would be responsible for any necessary permit from the USACE under the Clean Water Act Section 404. Based on the proposed schedule, construction at Gerlaugh Farm would start in approximately 2031with the buildings closest to Stream SB6 (#10 and #12) scheduled in approximately 2033 and 2034.

3.9.3.5 Floodplains

Both the proposed Hilltop and Gerlaugh Farm Parcels are well within Area B, outside the HRB boundary and above the FEMA 100-year floodplain of 813.4 feet above MSL The Hilltop site elevation is approximately 967 feet above MSL and 0.8 miles from the floodplain. The Gerlaugh Farm site elevation is approximately 854 feet above MSL and 1.3 miles from the floodplain. The MCD was consulted on November 29, 2023. MCD concurred on December 5, 2023 that, as the proposed projects are outside of the Huffman Storage Basin, they are not subject to MCD restrictions. The proposed actions would not adversely affect the retarding basin, as documented in Appendix A.

3.9.3.6 No Action Alternative

Under the No Action Alternative, WPAFB would not enter into an EUL for development of the Hilltop or Gerlaugh Farms parcels. Therefore, potential impacts to water resources – groundwater, surface water (storm water) and floodplains – would not change.

3.9.4 Cumulative Impacts

Construction activities associated with the Proposed Action and cumulative actions related to the AFIT Research Laboratory and Advanced Materials Research Laboratory (AMRL) are in the same general area of the Hilltop Parcel in Area B (listed in Table 3-1). These projects would have short-term, limited, cumulative adverse impacts on groundwater and surface water resources due to potential runoff from construction sites. For each site, impacts from runoff would be minimized by using BMPs. Once completed, however, cumulative increases in impervious surfaces from these cumulative projects would be considered a minor contribution in the context of the whole watershed.

3.10 Infrastructure

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. The infrastructure components discussed in this section include utilities (electrical power, natural gas, and water supply), sanitary sewer, storm sewer, communications, and transportation.

3.10.1 Regulatory Setting

Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to economic growth of an area.

3.10.2 Affected Environment

WPAFB has existing infrastructure to provide utility services throughout most of the Base. Under the proposed EUL projects, the proposed EUL developer would, with limited exceptions, connect to commercial/public utilities rather than the WPAFB systems. Existing WPAFB utilities on the proposed EUL parcels would have to be relocated or closed, capped, and abandoned in place. At the proposed Hilltop Parcel, WPAFB has existing water supply, sanitary sewerage, above ground and underground electrical service, natural gas, and storm sewerage in place. The proposed Gerlaugh Farm Parcel has very little utility infrastructure in place except services crossing the site down Mission Point Boulevard and fire protection water that enters the site from the east (from the I-675 interchange vicinity) to service the office building south of the parcel.

New utility connections would be made to service the proposed EUL developments and would be installed in existing right-of-way (ROW) adjacent to or beneath National Road for the proposed Hilltop Parcel, and Mission Point Boulevard or the Colonel Glenn Highway for the proposed Gerlaugh Farm Parcel. Utility connections would be made to the service provider's systems listed in Table 3-5.

Any system upgrade requirements would be negotiated between the utility service provider and the proposed EUL developer, with installation, permitting, and mitigation the responsibility of the service provider.

3.10.2.1 Transportation

The goal of the Greene County Engineer for the operation of all roadways is an overall level of service "D" or better during the peak traffic (design) hour of the roadway system. In areas where current levels-of-service are worse than 'D', the base level-of-service must be maintained or improved after development.

The operational goals for capacity analysis are:

- Intersection LOS: D or better
- Approach LOS: D or better
- Movement LOS: E or better

As stated in the Greene County 'Developer Traffic Study Requirements', if the "Build" condition significantly degrades (by one letter if LOS is D or above) the intersection compared to the "No Build" condition, mitigations shall be required to return the level of service to "No Build" levels.

Locally, the proposed Hilltop Parcel would be accessed from National Road. National Road is an extension of Grange Hall Road, which provides access to and from I-675 and commercial office and retail establishments south of WPAFB. National Road is also the primary artery providing access in and out of Gate 19B located just north of the proposed Hilltop Parcel. There are small businesses and residences along National Road, some of which are directly across the street from the Hilltop Parcel. March 2023 traffic count data for National Road showed average daily trips of 13,150 with a 1,114 morning peak and 1,573 evening peak (WPAFB, 2023b). Existing level-of-service ratings for the major National Road intersections are shown in Table 3-6.

The proposed Gerlaugh Farm Parcel is accessed off the Colonel Glenn Highway via Mission Point Boulevard. Immediate access to the Colonel Glenn Highway to the proposed Gerlaugh Farm Parcel is from the I-675 interchange east of the site, which also provides direct access to WPAFB Gate 22B. To the east of the Gerlaugh Farm site, the Colonel Glenn Highway extends past the intersection with National Road to Wright State University and beyond. Colonel Glenn

Highway is lined with office buildings and businesses such as retail, restaurants, and other services. To the west of the Gerlaugh Farm site is the Properties at Wright Field, a large development of privatized base housing accessed from Colonel Glenn Highway (which becomes Airway Road further west). The existing intersection and entrance at Mission Point Boulevard includes two westbound left-turn lanes, one eastbound right-turn lane, and traffic lights.

The existing LOS ratings for the Colonel Glenn Highway and Mission Point Boulevard intersection (including full buildout of the originally approved Mission Point development) is LOS C in both AM and PM peak periods.

3.10.3 Environmental Consequences

Impacts on infrastructure are evaluated for their potential to disrupt or improve existing levels of service and additional needs for energy and water consumption or sanitary sewer systems. Impacts might arise from energy needs created by either direct or indirect workforce and population changes related to Base activities.

3.10.3.1 Proposed Action

As part of site preparation for the proposed EUL developments, the developer would have to relocate or close, cap, and abandon in place existing WPAFB utilities on the proposed EUL parcels. At the proposed Hilltop Parcel, WPAFB has existing water supply, sanitary sewerage, above ground and underground electrical service, natural gas, and storm sewerage in place. The proposed Gerlaugh Farm Parcel contains much fewer existing utilities. Engineering has not been completed for either proposed EUL development, so specifics of these construction activities remain to be completed. All preliminary utilities disposition work, however, would occur in areas that would already be disturbed for site clearing, grubbing, grading, and excavation. Erosion and sediment control measures would already be in place for these areas, so the utilities work should not pose significant additional environmental impacts.

Engineering has also not been completed for new connections to public/commercial utility systems in National Road (for the proposed Hilltop Parcel) and the Colonel Glenn Highway (for the proposed Gerlaugh Farm Parcel). Most of the excavation and installation work for new connections would also be within the footprint of initial site development and would be subject to erosion and sedimentation controls. Connection points extending from the construction site proper onto or under the public roadway would include appropriate erosion and sediment controls, which would be included in project construction SWPPPs and permits.

No long-term impacts to infrastructure or utilities systems would be expected as a result of implementing the Proposed Action because the EUL facilities would not be using the installation's public services. In addition, long-term operation and maintenance of the EUL facilities would not be expected to impact existing utilities at WPAFB or from the provider.

These facilities are located within developed areas with well-supported utilities and sufficient capacity for growth. The developer would contact the providers when design details are available.

Transportation

Daily traffic would increase along National Road due to a temporary increase in construction-related equipment and vehicles. Once the new facilities at the Hilltop Parcel are functional and occupied, traffic along National Road would continue at levels higher than those experienced under current conditions. A maximum number of 1,215 parking spaces (at full buildout projected for 2031) are planned to accommodate workers and visitors to these buildings. The majority of the proposed development would be office space, so peak traffic is likely to be similar to that characteristic of National Road traffic using Gate 19B. Considering traffic patterns associated with the proposed retail, restaurant, and hotel uses would differ, and spreading the new traffic over two hours, peak traffic could increase by about 548 trips during the morning peak hour and 484 trips during the evening peak hour, an increase of approximately 49% during the morning peak and 31% during the evening peak. There would be noticeable impacts to small businesses and residences on the east side of National Road opposite the WPAFB fence line, especially at those locations directly across the street from the Hilltop Parcel. There would also be noticeable impacts to WPAFB employees using Gate 19B as the workforce and visitors at the Hilltop Parcel would contribute to the congestion and delays on National Road during peak hours.

Traffic would also increase along the segment of Colonel Glenn Highway where construction at Gerlaugh Farm would be located. Similarly, there could potentially be impacts associated with increased traffic on Colonel Glenn Highway due to construction-related vehicles during the construction phase and, subsequently, due to vehicles associated with workers and visitors at the Gerlaugh Farm Parcel. A maximum number of 480 parking spaces are planned for the new facilities. Gerlaugh Farm is located near the busy interchange of I-675 and Colonel Glenn Highway. Colonel Glenn Highway is a major thoroughfare where many of the businesses, services, amenities, and residences around WPAFB are concentrated.

Traffic studies were conducted to evaluate potential impacts resulting from additional traffic generated from each proposed EUL development (see Appendix D). Each study was developed in accordance with a Memorandum of Understanding established with the Greene County Engineer's Office who has primary jurisdiction over the off-base roadway network potentially affected by the proposed EUL developments in the vicinity of WPAFB. Both studies used current certified traffic volume, turning movement, and growth data recently developed by Greene County as part of their I-675 and Colonel Glenn Highway Interchange Study. The studies evaluated key roadway design and traffic parameters against criteria established by the Ohio Department of Transportation (ODOT) and the Greene County Engineer's Office. Appendix A contains copies of Greene County's approval letters for each site.

Hilltop Site

For the Hilltop site, the study area included the adjacent roadway network and the following key intersections:

- National Road and EUL Development access points (entrances/exits)
- Colonel Glenn Highway and National Road to the south
- National Road and Reese Drive/WPAFB Gate 19B to the north
- National Road and Kauffman Road further north

The analysis considered a "Build" and "No Build" (existing conditions) scenario for:

- 2025 Opening Year
- 2045 Design Year

Key results for the Hilltop development analysis included:

- Primary access from National Road would be from the north development access point using a signalized intersection with a northbound left turn lane from National Road of 515 feet, providing protected-permitted left turn phasing. The access point would include separate left and right turn exit lanes (providing right turn overlap phasing for eastbound right lane exits), with a minimum of 200 feet each and a minimum of one site entry lane. This intersection would be located to maximize the distance between the proposed new traffic signal and the Reese/WPAFB Gate 19B intersection signal; if that distance would be less than ¼ mile, it may be flipped to be the south site access point. The developer would be responsible for these improvements.
- A second unsignalized site access point would be located further south off National Road with a single site entry lane and single site exit lane (200 feet minimum). Left turns into and out of the site would be prohibited at this location. The developer would be responsible for these improvements.
- For the 2025 Opening Year, the existing traffic signal at National Road and Kauffman Road would be modified to provide an eastbound right overlap phase to run with the northbound left turn phase to alleviate projected Level of Service (LOS) impacts. (This improvement would be reviewed against safety-related improvements currently under consideration by the County for this intersection.)

The developer would incorporate these traffic features as part of design in order to mitigate traffic impacts from the proposed EUL development.

The Hilltop Traffic Study also identified additional existing traffic conditions in the roadway network affecting the 2025 Opening Year and the 2045 Design Year requiring a regional effort to mitigate. These conditions are not directly attributable to the proposed EUL Development, but the Hilltop EUL Development would contribute cumulatively to these existing impacts.

- With current WPAFB Gate 19B operations, capacity improvements are currently needed at the National Road and Reese/Gate 19B intersection in the 2025 study year with or without the addition of the proposed EUL development. The intersection should be widened to allow for a northbound dual left turn movement and a southbound dual right turn movement into WPAFB Gate 19B. Additional consideration may be necessary within the Base to allow for queuing of these vehicles for processing during the peak entering times. Design, funding and construction of these improvements require a regional effort between WPAFB, Greene County, and ODOT, and are not considered part of the proposed EUL development.
- For the 2045 Design Year, the Hilltop Traffic Study identified additional improvements necessary to the roadway network with or without the addition of the proposed Hilltop EUL development. Again, these improvements would also require a regional effort between WPAFB, Greene County and ODOT over the 20-year horizon to address modifications at Colonel Glenn Highway and National Road, National Road to the Reese/Gate 19B intersection, and the National Road and Kauffman Road intersection.

Gerlaugh Farm Site

For the Gerlaugh Farm site, the study area included the adjacent roadway network and the following key intersections:

- Colonel Glenn Highway and Mission Point Boulevard
- EUL Development access points (entrances/exits) off Mission Point Boulevard

The analysis required historical context because Mission Point Boulevard was initially approved for construction in 2008 to include office, retail and hotel uses south of the Gerlaugh Farm site, but to date, only a single 90,000 square foot office building has been constructed. Thus, the analysis included existing background traffic counts plus a Phase 1 and 500,000 square foot Mission Point Development component in the "No Build" conditions, with the proposed Gerlaugh Farm EUL Development added as the "Build" condition. The additional Gerlaugh Farm trip contribution is 17% of the morning peak and 14% of the afternoon peak.

The analysis considered a "Build" and "No Build" (existing conditions) scenario for:

- 2030 Opening Year

- 2050 Design Year

Key results for the Gerlaugh Farm development analysis included:

- The capacity analysis results for both the 2030 Opening Year Build condition and the 2050 Design Year Build Condition at the Colonel Glenn Highway and Mission Point Boulevard intersection meets Greene County's operational goals for LOS. During the morning peak for the westbound left turn (from Colonel Glenn Highway onto Mission Point Boulevard), "Queue Storage Ratio" is calculated as 1.0 for the 2030 Build condition and 1.04 for the 2050 Build condition (at or above capacity). This calculation assumes full buildout of the original Mission Point Development. In the worst-case scenario, in the 2050 Design Year Build Condition, the morning peak hour may experience less than desirable operation for the westbound left movement entering Mission Point which could be addressed with adjustments to the timing to ensure optimal operation, particularly during the potentially heavy inbound movement during the morning peak hour. For the remainder of the day, the intersection is anticipated to operate at acceptable levels. No improvements are recommended at the intersection of Colonel Glenn Highway and Mission Point Boulevard for opening day of the proposed development.
- Providing access to the eastern portion of the proposed Gerlaugh Farm EUL development is challenging due to the limited distance (approximately 175 feet) between Colonel Glenn Highway and the property line to the south on Mission Point Boulevard and the presence of a landscaped median that exists along the length of the proposed access location on Mission Point Boulevard. Therefore, the first existing internal intersection on Mission Point Boulevard would be widened by the developer to allow for a U-turn for vehicles accessing the eastern portion of the Gerlaugh development.

Greene County may revisit these provisions in the future as actual development of Mission Point Development and Gerlaugh Farm Development proceeds. Neither condition would be considered a significant adverse impact.

3.10.3.2 No Action Alternative

Under the No Action Alternative, the proposed EUL development projects would not be constructed at WPAFB and existing conditions, as described in Section 3.9.2, would remain the same. Therefore, there would be no short- or long-term impacts because there would be no change to infrastructure over baseline conditions.

3.10.4 Cumulative Impacts

Construction activities associated with the Proposed Action and cumulative actions related to the other MILCON projects in Area B (listed in Table 3-1) would have no short- or long-term impacts on the communications, sewer and wastewater, storm water drainage, or solid waste management systems at WPAFB because the EUL developers anticipate obtaining services directly from local utility providers.

The AMRL and AFIT Laboratory are also located in the same general area of the Hilltop Parcel. Short-term cumulative impacts on utilities would not be significant because construction would occur within the existing footprints of these facilities. The renovation projects would also be carried out over several years. With regard to long-term impacts, these facilities are located within a highly developed network of utilities and would unlikely be affected by the added usage of utilities at the proposed EUL facilities. The developer would contact the providers when design details are available.

Several proposed projects in the eastern portion of Area B would be conducted concurrently with proposed EUL construction at the Hilltop Parcel, including the Human Performance Wing Laboratory, the Advanced Materials Research Laboratory – Consolidate to Accelerate (C2A), and the AFIT Research Laboratory. Construction traffic for these projects – construction equipment, supplies, and daily labor – would likely access Area B via Gate 19B and National Road, aggravating traffic conditions and associated impacts. WPAFB may need to consider requiring construction traffic for those projects to access Area B via other gates to mitigate potential cumulative effects on National Road. To the extent that these new facilities would be staffed with new hires (rather than relocated WPAFB staff), their permanent operational traffic impact would need to be included in any traffic planning and future mitigation efforts on National Road.

There is the potential for impacts to traffic/transportation if construction work at Gate 22B and the EUL developments are concurrent. This ECP is another major gate for Area B. The ramp from I-675 to Gate 22B also branches off to Colonel Glenn Highway. If some of the Gate 22B traffic is routed to Colonel Glenn Highway during the reconfiguration of the gate, there could potentially be additional impacts to I-675 and Colonel Glenn Highway interchange.

As noted in Section 3.9.3.1, traffic studies have identified the need for regional improvements necessary to address existing deficiencies in the National Road network and restore LOS levels including:

- Capacity widening of the National Road and Reese/Gate 19B intersection for the 2025 study year.

- Capacity widening of the southbound National Road and Colonel Glenn Highway intersection for the 2045 design year.
- Capacity widening to five lanes of National Road from the Colonel Glenn Highway to the Reese/Gate 19B intersection for the 2045 design year.
- Capacity widening of the National Road/Kauffman Road intersection for the 2045 design year, including widening of Kauffman Road to accept the capacity improvements.

Contributions of traffic increases from the cumulative projects outlined above would need to be mitigated in the design of these regional future improvements. These improvements require a regional effort between WPAFB, Greene County, and ODOT.

3.11 Hazardous Materials/Waste

The regulatory setting, affected environment, and potential impacts associated with hazardous materials/wastes are discussed in the following sections.

3.11.1 Regulatory Setting

The terms, "hazardous material", "hazardous waste", and "hazardous substances" have specific legal definitions. AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, defines "hazardous material" as all items covered under the Emergency Planning and Community Right-to-Know Act (42 USC 1101 *et seq.)* or other applicable federal, state, or local tracking or reporting requirements; covered under 29 CFR 1910.1200 or 29 CFR 1450; and Class I or Class II ozone depleting substances as defined by 40 CFR 82.

"Hazardous waste" is defined and regulated by the Resource Conservation and Recovery Act (RCRA), which provides (42 USC 6903(5)):

The term "hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

1. Cause, or significantly contribute to an increase in mortality, or an increase in serious irreversible or incapacitating irreversible illness; or
1. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

USEPA's regulatory definition of hazardous waste under RCRA is at 40 CFR 2613 as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA considers a waste hazardous if meets certain levels of reactivity, ignitability, corrosivity, or toxicity, or is otherwise

listed as a hazardous waste in 40 CFR Part 261. In general, RCRA addresses day-to-day management of these wastes.

The Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) defines "hazardous substance" by reference to substances listed or designated under other laws and any element, compound, mixture, solution, or substance designated pursuant to CERCLA Section 102. A complete list of hazardous substances designated pursuant to CERCLA Section 102 with reportable quantities is provided in 40 CFR 302.4. A solid waste that is not on this list and is not excluded from regulation as a hazardous waste may be considered hazardous according to its ignitability, corrosivity, reactivity, or toxicity as defined by 40 CFR 261.20-24.

Evaluation of hazardous materials and wastes includes underground storage tanks (USTs) and aboveground storage tanks (ASTs) and the storage, transport, and use of pesticides and herbicides, fuels, and petroleum, oil, and lubricants (POLs). Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. 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 type of soil, topography, and water resources.

Special hazards are those substances that might pose a risk to human health but are not regulated as described above in this section. Included in this category are asbestos-containing materials (ACM), radon, lead-based paint (LBP), polychlorinated biphenyls (PCBs), and unexploded ordnance. The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

The Toxic Substances Control Act (TSCA) of 1976 provides USEPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. In general, both hazardous materials and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed.

Through its IRP, the DoD identifies, evaluates, and, where appropriate, responds to releases or threats of a release of contamination into the environment from DoD activities or DoD facilities. The IRP provides a uniform, thorough methodology to evaluate past disposal sites, to control the migration of contaminants, to minimize potential hazards to human health and the environment, and to clean up contamination. Knowledge of past IRP activities provides a useful gauge of the

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

EO 14057, *Catalyzing Clean Energy Industries and Jobs through Federal Sustainability* revoked EO 13834, *Efficient Federal Operations.* EO 14057 outlines a coordinated, whole-of-government approach, along with individual agency goals and actions, to transform the federal procurement and operations to reduce greenhouse gas (GHG) emissions and environmental impacts and secure a transition to clean energy and sustainable technologies. It establishes that the federal government will lead by example to achieve carbon pollution-free electricity sector by 2035 and net-zero emissions economy-wide by 2050. In addition, each federal agency shall annually divert at least 50 percent of non-hazardous solid waste including c&dd from landfills by fiscal year 2025 and 75 percent by fiscal year 2030. [WPAFB's goal is to meet a 60 percent c&dd diversion rate for construction and demolition projects that occur on Base. In order to achieve the 60 percent diversion goal, reclamation and recycling would be considered.]

The Ohio EPA, Division of Materials and Waste Management (DMWM) ensures solid waste, infectious waste, scrap tires, and construction and demolition debris are managed in accordance with applicable regulations. The DMWM contains a current listing of licensed municipal solid waste facilities on its website (Ohio EPA, 2018). Any construction projects that would occur at WPAFB would be handled by contractors bidding on projects that would select a licensed municipal solid waste facility from the list and any c&dd would be diverted to one of the facilities on the list. There are five licensed landfills within a 35-mile radius of WPAFB.

3.11.2 Affected Environment

The use, occurrence, management, and disposal of "hazardous material", "hazardous waste", and "hazardous substances" are described for WPAFB in general and at each of the EUL parcels specifically.

3.11.2.1 Hazardous Materials

AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, establishes procedures and standards that govern management of hazardous materials throughout the DAF. It applies to all DAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities. The Base utilizes a hazardous material management program (HMMP) through which hazardous materials are controlled from procurement through storage and issue to disposal.

The Installation Management Division Environmental Branch supports and monitors environmental permits, hazardous material and hazardous waste storage, spill prevention and

response, and participation on the Environmental Safety and Occupational Health Council (ESOHC). The Environmental Management System Cross Functional Team (EMS CFT) is a network of safety, environmental and logistics experts who work with hazardous material "HazMart" Managers, Unit Environmental Coordinators (UECs), and other hazardous material users to ensure safe and compliant hazardous material management throughout the Base (WPAFB, 2024a). Although outside the fence line, the EUL developments would be located on DAF property. The functional chiefs at WPAFB would be consulted regarding specific hazardous materials and waste management issues at the Hilltop and Gerlaugh Farm Parcels.

No hazardous substances were identified to have been stored for one year or more at the Hilltop Parcel; however, EFDZ 5 is located on the southern portion of the Hilltop Parcel and is part of Operable Unit 9 (OU 9) at WPAFB (WPAFB, 2021a). The EFDZ was identified as an IRP site because of the potential for disposal of hazardous chemicals and materials during or subsequent to fill placement. EFDZ 5 is discussed in more detail in the paragraphs regarding the Environmental Restoration Program (ERP) below.

For the Gerlaugh Farm Parcel, no hazardous substances were identified to have been stored for one year or more on the property. Furthermore, no potentially hazardous substances are known to have been disposed of or released at this property.

3.11.2.2 Hazardous Waste

The 88 CEG maintains a Hazardous Waste Management Plan (WPAFB, 2024a) as directed by AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*. This plan prescribes the roles and responsibilities of all members of WPAFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable federal, state, and local standards for solid waste and hazardous waste management. WPAFB is already classified as a large quantity generator and is responsible for stringent management and reporting requirements.

Based on the environmental Baseline Survey (EBS), there is no indication that quantities of hazardous wastes are being generated, stored, or disposed in connection with any operations at the Hilltop or the Gerlaugh Farm Parcels (WPAFB, 2021a,b).

3.11.2.3 Stored Fuels

Stored fuels present a potential threat to the environment that is mitigated at WPAFB through the Spill Prevention Control and Countermeasures (SPCC) Plan. The WPAFB SPCC Plan describes practices used to minimize the potential for stored fuel spills, prevent spilled materials from migrating off the base, and ensure that the cause of any spill is corrected. The WPAFB Facility Response Plan (FRP) describes emergency planning, notification, and spill response practices.

The SPCC and FRP have been combined into a single source document that is identified at WPAFB as the Integrated Contingency Plan (ICP) (WPAFB, 2018; WPAFB, 2024a). Based on the EBS, there is no indication that quantities of petroleum or petroleum wastes are being generated, stored, or disposed in connection with any operations at Hilltop Parcel (WPAFB, 2021a).

3.11.2.4 Storage Tanks

The EBS did not find evidence of ASTs, USTs, underground natural gas pipelines, hydrant fueling, or transfer systems. There are no records of oil water separators in the vicinity of the Hilltop Parcel.

One AST was identified at the Gerlaugh Farm Parcel (WPAFB, 2021b). An AST with unknown contents was identified south of the parcel boundary with piping that fed inside the CenterPoint Energy Building. There are no records of USTs, underground natural gas pipelines, hydrant fueling, transfer systems, or oil water separators at Gerlaugh Farm.

3.11.2.5 Pesticides

Applications of pesticides at WPAFB are completed in accordance with applicable federal regulations. No significant or inappropriate pesticide use, storage, or application was identified in the vicinity of the Hilltop or Gerlaugh Farm Parcels (WPAFB, 2021a,b).

3.11.2.6 Asbestos-Containing Materials

AFI 32-1001, *Civil Engineer Operations,* provides the direction for asbestos management at AF installations. AFI 32-1001 requires bases to develop an Asbestos Management Plan to maintain a permanent record of the status and condition of ACM in installation facilities, as well as documenting asbestos-management efforts. There are no structures at either the Hilltop or the Gerlaugh Farm Parcels; therefore, no ACM is expected to be present at these sites.

3.11.2.7 Lead-Based Paint

AFMAN 32-7002 describes applicable laws, regulations, and requirements for LBP management at DAF facilities. There are no structures at either the Hilltop or Gerlaugh Farm Parcels; therefore, no LBP is expected to be present at these sites.

3.11.2.8 Polychlorinated Biphenyls

WPAFB was declared PCB-free in 1997, meaning that there are no known transformers, devices, or equipment containing PCBs at regulated levels in use at WPAFB (WPAFB, 2021a). All electrical transformers were replaced or retro-filled with non-PCB fluids in the late 1990s. Transformers within the WPAFB boundary have been sampled and those transformers with PCBs greater than 50 parts per million (ppm) have been removed from service. Those

transformers located outside the WPAFB perimeter fence are the property of Dayton Power and Light.

One pad-mounted electrical transformer was observed near the northwestern corner of the Hilltop Parcel (WPAFB, 2021a). As this transformer is on the west side of National Road and within the WPAFB boundary, it should not contain PCBs greater than 50 ppm (WPAFB, 2021a). The transformer appeared to be in good condition with no indication of leaks or corrosion. There are no records of any historic PCB spills from transformers at the Gerlaugh Farm Parcel. In addition, there is no record of the use of any potential PCB-containing equipment or PCB equipment spills in the vicinity of the project area.

A pad-mounted transformer is also located on the southwestern boundary of the Gerlaugh Farm Parcel, near the CenterPoint Energy Building west of Mission Point Blvd (WPAFB, 2021b). The transformer appeared to be in good condition with no indication of leaks or corrosion. There are no records of any historic PCB spills from transformers at the Gerlaugh Farm Parcel. In addition, there is no record of the use of any potential PCB-containing equipment or PCB equipment spills in the vicinity of the project area.

3.11.2.9 Environmental Restoration Program

The ERP has three program categories: Installation Restoration Program (IRP), Military Munitions Program (MMRP), and building demolition and debris removal. The Base began its IRP in 1981 with the investigation of possible locations of contamination. In 1988, WPAFB entered into an Ohio Consent Order with the Ohio EPA. In October 1989, WPAFB was placed on the USEPA's National Priorities List, which is a list of sites considered to be of special interest and require immediate attention.

The Base has identified 73 IRP sites, two regional groundwater sites, and several areas of concern per the Air Force Restoration Information Management System. The Base has grouped the majority of confirmed or suspected sites requiring investigation and characterization in 11 geographically-based OUs, designated as OUs 1 through 11 (IT, 1999). In addition to the 11 OUs, WPAFB addressed base-wide issues of groundwater and surface water contamination by creating the Groundwater Operable Unit (GWOU) under the Basewide Monitoring Program. The GWOU is monitored by agreement with the Ohio EPA and USEPA under the Long-Term Monitoring Program. Principal groundwater contaminants beneath WPAFB include benzene, toluene, ethylbenzene, xylene, trichloroethene, and tetrachloroethene (WPAFB, 2007). Water resources concerns are addressed under Section 3.2 of this EA.

With respect to this EA, IRP sites have been identified on or in the vicinity of the EUL parcels (Figure 3-7). Table 3-7 indicates five EFDZs closest to the Hilltop Parcel were all investigated as part of OU 9. According to the ROD dated September 30, 1998 (WPAFB, 1998), the EFDZs

were identified as IRP sites because of their potential for past disposal of hazardous chemicals or materials during or subsequent to fill placement (WPAFB, 2021a). Of these EFDZs, EFDZ 5 is located on the southern portion of the Hilltop Parcel that is within the area planned for construction. The other four EFDZs are over 1,000 feet from the property.

In accordance with *Policy on Land Use Controls Associated with Environmental Restoration Activities* (DoD, 2001), DoD facilities must implement plans for future land use activities into the environmental restoration process and ensure those activities are compatible with land use restrictions currently imposed on the affected property. WPAFB implements, monitors, maintains, and enforces remedies that protect human health and the environment and establishes LUCs as described in WPAFB's LUCIP (WPAFB, 2019). Under the IRP, the current land use at EFDZ 5 is characterized as "recreational". The current engineering controls at the site include the base perimeter fence and signage. Allowable land uses at IRP sites on and near the Hilltop Parcel are specified in Table 3-7.

Following the completion of a Site Inspection at EFDZ 5 and as summarized in the ROD (WPAFB, 1998), bis(2-ethylhexyl)phthalate exceeded the Maximum Contaminant Level (MCL) and Preliminary Remediation Goals (PRGs). Arsenic exceeded the PRG in groundwater. Based on the human health risk assessment (HHRA), arsenic was considered to be naturally-occurring and the PRG exceedance was not significant. It was concluded that bis(2-ethylhexylphthalate was not likely to migrate far at concentrations greater than the MCL or act as a source of continuing releases to groundwater due to its tendency to adsorb to soils. Therefore, the presence of bis(2-ethylhexyl)phthalate was also considered to be insignificant. Similarly, the HHRA determined that most of the compounds detected in soils were below PRGs. Only arsenic exceeded the PRG; however, it was determined to be present at concentrations considered to be naturally-occurring (WPAFB, 2021a; WPAFB, 1998). No significant ecological effects were identified and no adverse human health effects were expected. Therefore, the DAF determined that no remedial action for soil was necessary to ensure protection of health and the environment at EFDZ 5 as indicated in the ROD (WPAFB, 1998).

No IRP sites were located on the Gerlaugh Farm Parcel; however, the ROD (WPAFB, 1998) identified two burial sites within 1,000 feet of Gerlaugh Farm. Table 3-8 lists Burial Site 3 and Burial Site 6, which are located across Colonel Glenn Highway and within the WPAFB fence line north of Gerlaugh Farm. Neither of these burial sites were found to pose an unacceptable risk or hazard to human health or the ecological environment. Therefore, no action was required at either burial site.

3.11.2.10Aqueous Film Forming Foam (AFFF) Sites

In addition to the IRP sites, 26 AFFF sites are currently being investigated as part of a multi-year effort to address releases of per- and polyfluorinated alkyl substances (PFAS) to the environment

(WPAFB, 2024b). The AFFF identified in Area B are shown in Figure 3-7. None of these sites are in close proximity to the Hilltop or Gerlaugh Parcels; estimated distance to the closest site is approximately 0.5 miles from both sites.

3.11.2.11 Military Munitions Response Program

No military munitions or ordnance have been used, stored, disposed, or spilled within the Hilltop or Gerlaugh Farm Parcels (WPAFB, 2021a and 2021b). The closest location of a Military Munitions Response Program (MMRP) site is the Abandoned Ordnance and Skeet Range (TS896) in Area A. The TS896 site is located downgradient and at a distance greater than 1,000 feet of the Hilltop Parcel. As a result, there would be no impacts due to MMRP sites at either parcel.

3.11.3 Environmental Consequences

Impacts to hazardous material management would be considered adverse if the federal action resulted in noncompliance with applicable federal and state regulations, or increased the amounts generated or procured beyond current WPAFB waste management procedures and capacities.

Impacts on pollution prevention would be considered adverse if the federal action resulted in worker or visitor exposure to these materials, or if the action generated quantities of these materials beyond the capability of current management procedures. Impacts on the IRP would be considered adverse if the federal action disturbed (or created) contaminated sites resulting in negative effects on human health or the environment.

3.11.3.1 Proposed Action

Potential impacts to hazardous materials, hazardous wastes, and hazardous substances are described in the following sections.

Hazardous Materials

Products containing hazardous materials would be procured and used during construction of the new facilities at the Hilltop and Gerlaugh Farm Parcels. It is anticipated that the quantity of products containing hazardous materials used during these activities would be minimal and their use would be of short duration. No hazardous materials, other than those typically associated with construction projects, are expected to result from the Proposed Action.

Construction of the buildings and parking lots would require the use of hazardous materials such as petroleum products, sealants, and paints. These materials are currently used at WPAFB. Contractors would be responsible for the storage, use, and disposal of construction materials in accordance with current practices and management schemes. There are five licensed landfills within 35 miles of WPAFB. Montgomery County has four landfills and Greene County has one. The cumulative available space of these landfills allows for over 1 million cubic yards per year

for at least 15 more years (WPAFB, 2020). Taking into consideration the requirement for diversion and the number of landfills in the area for c&dd waste, construction debris for the EUL projects would likely have insignificant impacts on the capacities of the landfills in the area. Materials would be stored in containers that meet federal, state, and local requirements. Secondary containment systems would be employed as necessary to prevent or limit accidental spills.

Although the new facilities would be located on DAF property, the EUL developer and tenants would be responsible for the management of hazardous materials in accordance with federal and state regulations. Any hazardous, toxic, recyclable, and otherwise regulated waste streams generated by DAF tenant operations would be managed through the 88th Civil Engineer Group Environmental Branch in accordance with the WPAFB Hazardous Waste Management Plan (WPAFB, 2024a). Therefore, hazardous materials management would not be impacted by construction of EUL facilities.

Once operational, it is anticipated that potential impacts from hazardous materials would be minimal. Chemicals used in the new facilities at both sites would be consistent with those currently used in office buildings and other routine business settings (office materials, cleaning products). If hotel and restaurant spaces are included in plans at the Hilltop Parcel, impacts would be similar. Use of other concentrated chemicals in the new facilities is not anticipated.

The proposed EUL developer and tenants would be responsible for proper storage of any hazardous materials and provision for emergency response procedures with local emergency response agencies in accordance with federal, state, and local regulations. Any DAF tenant hazardous materials storage locations would be provided with emergency response procedures and site-specific contingency plans established by WPAFB. Any change in the quantity of hazardous materials stored at either parcel during construction and/or operation of the new facilities would be recorded and reported to local emergency planning committees and local fire departments as required by applicable requirements.

Hazardous Wastes

It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be similar in nature with the baseline condition waste streams. The proposed EUL developer and its contractors would be responsible for any hazardous wastes generated from construction activities. Construction of the new facilities would not impact the Base's hazardous waste management program.

In addition, hazardous wastes generated by the proposed operations would be managed in accordance with applicable Ohio and federal regulations. Hazardous wastes generated and managed for disposal would be similar in types and quantities to those currently generated in

similar office and administrative settings. Any hazardous waste generated from DAF tenants in the proposed EUL development would be managed under the existing WPAFB Hazardous Waste Management Plan (WPAFB, 2024a).

Any hazardous waste storage locations would be provided with emergency response procedures and site-specific contingency plans established by WPAFB. Any change in the quantity of hazardous waste stored on Base during construction and/or operation of the facilities would be recorded and reported to local emergency planning committees and local fire departments as required by applicable requirements.

Stored Fuels

Fuels such as gasoline and diesel would likely be used in some of the construction equipment. During construction, fueling activities would create the potential for minor spills and releases. The construction contractor would be responsible for employing BMPs to reduce the potential for spills and ensure quick clean up.

Once operational, it is unlikely that fuels will be stored at these sites based on the nature of the new facilities at the Hilltop and Gerlaugh Farm Parcels.

ACM, LBP, PCBs

There would be no impacts from ACM and LBP as there are no existing structures at either parcel. Although there is one pad-mounted transformer at the Hilltop Parcel, electrical transformers within the WPAFB fence should not contain PCBs over 50 ppm. The pad-mounted transformer at Gerlaugh Farm is outside the fence line labeled as “Non-PCB”. Both pad-mounted transformers are reported to be in good condition with no evidence of leaks or corrosion. Therefore, no impacts from PCBs would be expected during construction or operation of the new facilities.

Environmental Restoration Program

Figure 3-6 shows the EFDZs in OU 9 in the vicinity of the proposed construction at the Hilltop Parcel. EFDZ 5 is within the proposed footprint of the development on the southern portion of the parcel. EFDZs were originally identified as IRP sites because of the potential for disposal of hazardous chemicals and materials during or subsequent to fill placement. Based on the results of investigations at EFDZ 5, there was no indication of the disposal of hazardous materials at these sites; however, materials similar to those disposed of at other landfills may have been transported to these sites. WPAFB consulted with Ohio EPA and USEPA regarding the ROD and no modifications were required for the proposed EUL project to move forward. To ensure the continued land use controls and public safety, WPAFB would implement the following items described in the Ohio EPA letter dated 15 February 2024 and USEPA letter dated 26 April 2024 (Appendix A):

- The allowable land use would change from recreational to industrial/commercial. The current LUCIP has been annotated stating that for EFDZ5, current land use is recreational and upon the property becoming an EUL, the land use would change from recreational to industrial/commercial. Once the EUL lease has been finalized and signed, WPAFB would annotate the LUCIP to indicate the land use change has been implemented.
- Vapor intrusion mitigation measures would be incorporated into the design of the buildings to be constructed within the boundaries of EFDZ 5 on the Hilltop Parcel. These measures would be the responsibility of the developer.
- Any excess soil to be removed off-base would be sampled and profiled. Sampling would include PFAS. These measures would be the responsibility of the developer.

Construction or earth disturbance in or within 300 feet of a landfill typically requires submittal and approval of a Rule 513 Application by Ohio EPA prior to construction. For future construction on the Hilltop Parcel impacting the EFDZ, WPAFB would submit a Rule 513 Application to Ohio EPA.

No long-term impact would be expected at the Hilltop Parcel because of the measures implemented in accordance with applicable Ohio EPA and USEPA regulations. There would be no impacts to IRP sites at the Gerlaugh Farm Parcel because no sites were identified at this property.

Solid Waste

It is anticipated that the quantity of solid waste generated would be minimal because there would be no demolition. Solid waste typically associated with construction projects are expected to result from the Proposed Action.

3.11.3.2 No Action Alternative

Under the No Action Alternative, the DAF would not enter into an EUL for either property and existing conditions would remain the same. The proposed sites are currently vacant and there are no hazardous materials or wastes being used, generated, stored, or disposed. Therefore, there would be no short- or long-term impacts because there would be no changes in existing hazardous materials/waste usage over baseline conditions. In addition, no impacts to ERP sites would occur because there would be no ground disturbance of EFDZ 5 at the Hilltop Parcel.

3.11.4 Cumulative Impacts

Construction of the proposed EUL facilities in conjunction with the other projects would not impact the Base's hazardous waste management program because hazardous materials and wastes would be handled, stored, transported, disposed of, or recycled in accordance with applicable regulations and the WPAFB Hazardous Waste Management Plan (WPAFB, 2024a), as appropriate. All hazardous wastes would be managed in accordance with applicable Base, Ohio and federal regulations.

As discussed in Section 3.1, cumulative impacts would be expected from the total construction and demolition debris (c&dd) from multiple projects at WPAFB and within the community. The proposed EUL projects would be phased over several years and primarily involve construction-related materials. Considering the number of other past, present, or future foreseeable projects at WPAFB over the next 10 years (Table 3-1), the incremental effects of construction debris from the proposed action on local landfills would be expected to be insignificant when added to the effects from cd&d from these other projects.

With respect to IRP sites, there is also an EFDZ (EFDZ 8) on the proposed site for the Advanced Materials Research Laboratory project, which is in the same general area of Area B. Procedures for digging and excavation at EFDZs would be similar. No cumulative impacts due to construction at or within 300 feet of the EFDZs would be expected.

3.12 Safety and Health

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. The following sections address safety and health as they pertain to munitions and explosives, construction, and anti-terrorism/force protection (ATFP).

3.12.1 Regulatory Setting

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends

primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of highly noisy environs. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation processes creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns. The public would have no access to the construction activities associated with the Proposed Action.

3.12.1.1 Munitions and Explosive Safety

Explosives are classified based on their reactions to specific influences. The explosives hazard class is further subdivided into "division", based on the character and predominance of the associated hazards and their potential for causing personnel casualties or property damage.

Explosive safety zones (ESZs) are required for areas where ordnance is stored or handled. The ESZs are typically determined based upon the net explosive weight of the ordnance to be stored or handled and the blast resistance properties of the magazine. Explosive Safety Quantity Distance (ESQD) arcs that delineate the extents of each ESZ are constructed. Neither the Hilltop nor the Gerlaugh Farm Parcels are within an ESZ or ESQD.

3.12.1.2 Construction Safety

Construction site safety consists primarily of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of on-site military and civilian workers are safeguarded by DoD and DAF regulations designed to comply with standards issued by Occupational Safety and Health Administration (OSHA) and USEPA. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors. In addition, health and safety plans are typically developed by the contractor on a project-specific basis.

3.12.1.3 Anti-Terrorism/Force Protection

The DoD seeks effective ways to minimize the likelihood of mass casualties from terrorist attacks against DoD personnel in the buildings in which they work and live. The intent of Unified Facilities Criteria (UFC) 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*, is to minimize the possibility of mass casualties in buildings or portions of buildings owned, leased, privatized, or otherwise occupied, managed, or controlled by or for DoD. The UFC standards provide appropriate, implementable, and enforceable measures to establish a level of protection against terrorist attacks for all inhabited DoD buildings where no known threat of terrorist activity currently exists.

UFC mandates minimum standoff distances for new and existing buildings and for those buildings to exist within or outside of a controlled perimeter. Standoff distances are distances maintained between a building or portion thereof and the potential location for an explosive detonation, primarily an adjacent roadway, parking area, and/or trash cans. A controlled perimeter is a physical boundary at which vehicle access is controlled with sufficient means to channel vehicles to the access control points. At a minimum, access control at a controlled perimeter requires the demonstrated capability to search for and detect explosives.

3.12.2 Affected Environment

The following sections describe current safety and health factors at WPAFB and the EUL parcels.

3.12.2.1 Munitions and Explosives Safety

No military munitions or ordnance have been used, stored, disposed, or spilled within the Hilltop or Gerlaugh Farm Parcels (WPAFB, 2021a,b). The closest location of a Military Munitions Response Program (MMRP) site was the Abandoned Ordnance and Skeet Range (TS896). The TS896 site is located downgradient in Area A and at a distance greater than 1,000 feet of the Hilltop Parcel. This MMRP site consisted of an abandoned ordnance area, which included ordnance storage buildings and outdoor storage areas, and a former skeet range. Furthermore, neither the Hilltop nor the Gerlaugh Farm Parcels are located within an ESZ or ESQD.

3.12.2.2 Construction Safety

All contractors performing construction activities are responsible for following ground safety regulations and worker compensation programs and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and availability of Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemical (e.g, fuels for construction equipment, paints, building materials), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures.

3.12.2.3 ATFP

At the Hilltop Parcel, a floor of at least one of the facilities would be designated for use by DAF personnel; therefore, ATFP standards would apply. There are exceptions, however, for facilities associated with EULs on DoD installations unless a facility warrants additional protection due to its specific purpose and/or location per 10 USC 2667(b)(8). A pedestrian gate could be included

in the relocated fence to allow Base personnel access to the new mixed-use development; however, setback requirements might impact developable area. None of the space at the Gerlaugh Farm facilities would be used by the DAF. The specific requirements for ATFP would be addressed in the lease agreements.

3.12.3 Environmental Consequences

Impacts on health and safety are evaluated for their potential to jeopardize the health and safety of Base personnel as well as the surrounding public. Impacts might arise from physical changes in the work environment, demolition and construction activities, introduction of demolition and construction-related risks, and risks created by either direct or indirect workforce and population changes related to proposed Base activities. DAF regulations and procedures promote a safe work environment and guard against hazards to the public. The WPAFB programs and day-to-day operations are accomplished according to applicable DAF, federal, and state health and safety standards.

3.12.3.1 Proposed Action

Potential impacts to health and safety are addressed in the following sections.

Munitions and Explosives Safety

No adverse effects due to munitions or explosives safety would be expected to occur from constructing the new facilities. No munitions or explosives are currently used or would be used in future activities at either EUL site.

Construction Safety

Potential short-term impact to workers could occur during construction activities. Implementation of the Proposed Action would slightly increase the short-term risk associated with contractors performing construction activities at WPAFB during the workday.

Contractors would be required to establish and maintain safety programs, develop health and safety plans, and adhere to standard operating procedures. Any potential adverse impacts to the health and safety of nearby personnel would be minimized by clearly identifying the work zone and prohibiting access to unauthorized individuals. Use of high-profile equipment would require a “spotter” when operating near any overhead hazards. To minimize vehicle accidents, contractors would direct heavy vehicles entering and exiting construction site. The Base has also incorporated stringent safety standards and procedures into day-to-day operations. In addition, proper excavation techniques would be used to ensure that existing underground utility lines are not damaged; in the event a utility line is cut or otherwise damaged, on-site personnel would need to implement emergency procedures. Therefore, no adverse effects are anticipated as a result of the Proposed Action due to safeguards existing to protect personnel.

Facility Safety

Once operational, long-term potential impacts due to workplace activities would be minimized by adherence to health and safety regulations and standards.

Protection of Children

Children are present daily during the workday at the WPAFB childcare facilities immediately adjacent to the west of the proposed Hilltop Parcel over the same operating hours as the office development. The existing WPAFB security fence would be relocated from National Road to the western boundary of the Hilltop Parcel, providing some safety-related separation of the proposed Hilltop EUL construction and operational activities. Although there are likely few children living directly across National Road, those children would not be protected by a security fence and from potential impacts due to additional traffic (road crossings) or unfamiliar people at the proposed Hilltop EUL mixed-use (retail, restaurant, hotel) and office operations. As there would likely be safety concerns on any of the busy roads that surround the perimeter of the Base, children would not be disproportionately affected at this particular location.

The only residential area near the Gerlaugh Farm Parcel is directly west of the site. Although the Gerlaugh Farm Parcel would not have a permanent security fence, it would be unlikely that children from nearby residences would cross a busy road to access the site. Site operations would be limited to office uses with no commercial uses by the general public. With installation of a site security fence during construction, potential impacts to nearby children should be minimal.

ATFP

At the proposed Hilltop Parcel, specific ATFP provisions for DAF presence in specific office buildings would be established prior to construction. To maintain Base security, the new ("relocated") security fence would be installed on the western side of the proposed Hilltop Parcel prior to removal of the existing security fence. Adjacent to the installation perimeter fence, the lessee would maintain a 30 ft clear zone in accordance with UFC 04-22-03 to include construction of an 8-inch curb to deter vehicles from entering the clear zone. No adverse effects to ATFP would be expected at the Gerlaugh Farm because there would be no DAF presence.

3.12.3.2 No Action Alternative

Under the No Action Alternative, the DAF would not enter into an EUL at WPAFB and existing conditions, as described in Section 3.10.2, would remain the same. There would be no change to and no short- or long-term impacts to Munitions and Explosives safety. There would be no construction workers or equipment on site. Facility safety and ATFP would not be pertinent as there would be no facilities at either site.

3.12.4 Cumulative Impacts

Construction and demolition activities associated with the Proposed Action and cumulative actions related to projects listed in Table 3-1 would have potential short-term cumulative adverse impacts on health and safety (e.g., slips, falls, heat exposure, exposure to mechanical, electrical, vision, or chemical hazards). Implementation of appropriate safety methods during these activities would be expected to minimize the potential for such impacts. Workers at construction sites would be required to adhere to site specific health and safety plans; construction areas would be secured to prevent unauthorized personnel from entering work sites; and in accordance with the Occupational Safety and Health Act, all workers would be provided with appropriate personal protective equipment. Therefore, no significant cumulative impacts to safety and occupational health would be anticipated.

3.13 Socioeconomics

Socioeconomics is the relationship between economics and social elements such as population levels and economic activity. The following sections describe the demographics and employment characteristics of WPAFB and the surrounding communities and assess potential socioeconomic impacts from the proposed action.

3.13.1 Regulatory Setting

Factors that describe the socioeconomic environment represent a composite of several interrelated and nonrelated attributes. There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region.

3.13.2 Affected Environment

Demographics. Metropolitan statistical areas are geographic entities defined by the Office of Management and Budget for use by federal statistical agencies in collecting, tabulating, and publishing federal statistics. A metro area contains a core urban area of 50,000 or more of a population. Each metro area consists of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core (Census 2023).

WPAFB is located 10 miles outside of Dayton, Ohio. According to the 2020 Census data, the city of Fairborn had a population of 34,510; the city of Dayton had a population of 137,644 (-2.7% from 2010); and the Dayton Metropolitan Area (MA) (consisting of, Greene, Miami and

Montgomery counties) had a population of 814,049 residents. Based on the 2020 Census data, the Dayton MA was the fourth largest metropolitan area in Ohio.

Employment Characteristics. The Base provides a major source of employment in the five-county area. In addition, WPAFB awards numerous contracts every year to local businesses. For FY2021, the total number of jobs provided by WPAFB was over 30,000 – 35,000. This number includes military active duty, trainees and reservists, DoD civilians, and other civilians, such as contractors. This number of indirect jobs supported by the Base, such as restaurants, dry cleaners, and others is estimated at 34,560 -43,560. The total economic impact to the local Dayton-Springfield MSA was $4.2 – 6.5 billion.

Recent unemployment rates indicate the unemployment rate for the Dayton MSA was 3.8 percent in June 2023 (Bureau of Labor Statistics [BLS] 2023a), the same as the U.S. average, down from the 2020 annual average of 8.0 percent (15.0 percent peak) during the COVID-19 peak. The June 2023 Dayton MSA unemployment rate was slightly higher than the state average of 3.4 percent in the same month (BLS 2023b).

At WPAFB, the EUL program is an opportunity to develop two approximately 23-acre parcels within the existing WPAFB installation for commercial purposes. This opportunity would allow for rapid innovation and collaboration that the DAF and U.S. Space Force are immediately seeking. The EUL developments at the Hilltop and Gerlaugh Farm Parcels would ultimately result in the construction of 500,000+ square feet and a projected 2,000+ jobs to support these missions.

3.13.3 Environmental Consequences

This section identifies potential economic and social impacts that might result from the proposed project. The methodology for the economic impact assessment is based on the Economic Impact Forecast System (EIFS) developed by the DoD in the 1970s to efficiently identify and address the regional economic effects of proposed military actions (EIFS, 2001). The EIFS provides a standardized system to quantify the impact of military actions, and to compare various options or alternatives in a standard, non-arbitrary approach.

The EIFS assesses potential impacts on four principal indicators of regional economic impact: business volume, employment, personal income, and population. As a “first tier” approximation of effects and their significance, these four indicators have proven very effective. The methodology for social impacts is based on the Guidelines and Principles for Social Impact Assessment, developed by an inter-organizational committee of experts in their field (National Oceanic and Atmospheric Administration [NOAA], 1994).

The proposed project at WPAFB would have an impact on the socioeconomic conditions in the surrounding MA if it would:

- Change the local business volume, employment, personal income, or population that exceeds the MA's historical annual change; and/or
- Affect social services or social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates.

3.13.3.1 Proposed Action

An EUL is a lease between the DAF and third party on non-excess, underutilized DAF land for commercial development for a lease term for approximately 20 – 50 years (DAF, 2023). Rising costs and shrinking budgets have pushed the DAF to find new ways to offset expenses. An EUL empowers the DAF to lease underutilized assets to private industry that would ultimately generate additional funding. Leveraging real property helps the DAF to provide solutions for underfunded needs.

The EUL program enables the DAF to optimize the full value of its real property assets. In exchange for leasing property, the DAF receives cash, in-kind consideration, or a combination of both for fair market value. Installations can use the lease revenues to offset budget costs and provide value to the warfighter. EULs must mutually benefit the DAF, the developer, and the community.

On a community level, the Proposed Action would have a beneficial impact on the local workforce as construction businesses, workers, and suppliers would have opportunities for contracts at both EUL parcels. A short-term beneficial impact would be expected on the local economy from revenue generated by construction activities.

Once the new facilities are operational, the business space would be expected to attract businesses seeking collaboration with and proximity to DAF partners and customers. Between the Hilltop and Gerlaugh Farm developments, space would be available to a variety of businesses including administrative, research and development, and technology. The Proposed Action would be estimated to create approximately 2,000 engineering and technology and related jobs. With the potential to include a hotel and restaurant on the Hilltop Parcel, opportunities could also be available in the hospitality sector. Changes in local services (such as fire, law enforcement, and medical), property values, school enrollment, and county and municipal expenditures would be expected to be insignificant.

In the long-term, recapitalization considerations should be made for facility maintenance and upkeep in anticipation of release to the DAF at the conclusion of the EUL.

3.13.3.2 No Action Alternative

Under the No Action Alternative, the proposed EUL development project would not be constructed at WPAFB and existing conditions, as described in Section 3.11.2, would remain the same. There would be no short- or long-term impacts because there would be no changes in activities that would affect the local workforce or local economy over baseline conditions.

3.13.4 Cumulative Impacts

The Proposed Action would incrementally contribute to the overall beneficial impacts on the local workforce from the construction projects planned at WPAFB as well as in the surrounding community in the reasonably foreseeable future (Section 3.1). A short-term beneficial impact would be expected on the local economy from revenue generated by multiple construction contracts. In the long-term, the facilities at the EUL sites would be projected to add up to 2,000 engineering and technology jobs to the overall business community surrounding WPAFB. The additional workforce would have a positive incremental effect on the economy by using the services and amenities in the area of the base.

Those projects that are intended to spur future growth in the surrounding communities could potentially impact public services (such as fire protection and law enforcement), housing, medical care, and social services. Incremental effects on these services from operations at the EUL developments, when added to the effects of those other projects, would be expected to be insignificant. The surrounding communities (such as city of Beavercreek, city of Fairborn, and Greene County) develop and maintain comprehensive plans to manage current and future needs for public services, housing, medical care, and social services.

3.14 Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The following sections discuss environmental justice with respect to the proposed EUL developments.

3.14.1 Regulatory Setting

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to the greatest extent practicable and permitted by law, identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. EO 12898 was expanded and strengthened by EO 14096 *Revitalizing Our Nation's Commitment to Environmental Justice for All* (dated April 2023). EO 14096 requires federal agencies to identify, analyze and address disproportionate and adverse human health and

environmental effects, risks, and hazards of federal activities, including those related to climate change and cumulative impacts on communities with environmental justice concerns.

CEQ guidance regarding EO 12898 and NEPA (CEQ, 1997) states that "minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis." Minority is defined as: Alaskan Native, American Indian, Black, Asian, Pacific Islander, or persons of Hispanic origin. A low-income population is defined as persons living below the poverty threshold as determined by the Census Bureau.

Low-income status was based upon comparing the income of the proposed project site and larger study area residential population to the U.S. Census Bureau Poverty Threshold. The CEQ guidelines do not specifically state the percentage considered meaningful in the case of low-income populations. The Census Bureau measures poverty using a set of money income thresholds that vary by family size and composition following the Office of Management and Budget's Statistical Policy Directive 14. The official poverty thresholds do not vary geographically but are updated for inflation using the Consumer Price Index.

3.14.2 Affected Environment

A screening analysis using U.S. Census Bureau racial and economic information catalogued by Demographic Profile 5-Year Estimates for the years 2017 through 2021 was reviewed using the American Community Survey [ACS] economic and demographic and housing estimates to identify low income and minority populations living in the vicinity of Areas A and B of WPAFB and in the geographic region.

Figure 3-7 shows the census tracts surrounding WPAFB and the proposed EUL sites. Census Tract 2803 represents the on-Base population. Montgomery County Tract 9800 includes the west portion of Area B of WPAFB; however, no data is reported for Tract 9800. Demographics for Tract 9800 are included within Tract 2803, which includes the entirety of WPAFB (Census 2023). Off-Base Census Tracts potentially affected by the construction and operations at the proposed EUL parcels include: 2001.04 directly to the east of the proposed Hilltop site; 2101 to the south and southeast; and 911, 908 and 907 to the west-southwest.

Table 3-9 presents a comparison of WPAFB economic and demographic characteristics to surrounding off-Base communities and the state of Ohio using the 2017 – 2021 5-Year ACS Census Tract estimates.

Tract 2001.04 had the largest total population (5,665 persons) of the comparison geographies as compared to the on-Base population (1,871 persons).

Census Tract 2001.04 also had the highest percentage of the population (36.5%) with income below the Census Bureau Poverty Threshold than the on-Base population (7.4%) [NOTE: poverty threshold was set at $27,479 in 2021 by the Census Bureau for a household of four persons]. Census Tract 2001.04 also had a considerably lower median household income ($36,962) than that compared with the median household income of the on-Base population ($64,063) and other potentially affected census tracts. The demographic data for Census Tract 2001.04 likely reflect the presence of Wright State University in this tract resulting in higher population, lower age levels, fewer children, and lower income/poverty levels.

The Environmental Justice Index (EJI) is a national place-based, data-driven tool developed by the U.S. Center for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR) to characterize environmental burden and cumulative impacts of communities by census tract. The online tool (https://www.atsdr.cdc.gov/placeandhealth/eji/index.html) uses data from the U.S. Census Bureau, EPA, the U.S. Mine Safety and Health Administration and the CDC to calculate a data-based rank index for 36 environmental, social, and health factors across more than 71,000 census tracts. The index uses those rankings to calculate three overarching modules: the Environmental Burden module, the Social Vulnerability module and the Health Vulnerability module. A final ranking is produced by combining those three module rankings. In each case a ranking is calculated between 0 and 1, with an indicator of concern identified as a ranking of 0.75 or higher. The EJI is intended as a high-level mapping and screening tool to characterize cumulative impacts and patterns of environmental justice nationwide and is not intended to label or fully characterize environmental justice issues within a community.

Table 3-10 summarized EJI rankings for select census tracts to the south of WPAFB. Of those evaluated, 1 of 6 had total EJI rankings above 0.75, with 2 of 6 ranked above 0.75 for Environmental Burden. These rankings do not reflect environmental, social or health burdens specifically imposed by WPAFB activities but include impacts and existing conditions associated with the WPAFB and metropolitan Dayton region. The data indicate that there are several communities in the WPAFB vicinity subject to environmental justice burdens.

Table 3-11 lists specific indicators of concern by census tract that are > 0.75 or a high prevalence of a chronic health condition.

The data summarized in Table 3-10 indicate that Census Tract 2001.04, directly across National Road from the proposed Hilltop parcel, falls into the “High” category of communities with EJI burdens relative to other census tracts nationwide, and relative to other census tracts in direct proximity to the proposed EUL parcels. WPAFB itself (Census Tract 2803) and Tracts 908 and 907, southwest of the proposed Gerlaugh Farm Parcel, fall into the “Moderate to High” quartile, and the adjacent Tract 911 falls into the “Low to Moderate” quartile. All the tracts contain a 0.91

Water Pollution ranking, likely due to the TMDL for suspended solids impairment on the nearby Mad River. WPAFB (Tract 2803) and Tract 2001.04 contain high rankings for proximity to potential toxic and hazardous waste sites.

Along with the indices summarized in Table 3-10, the specific indicators listed by tract in Table 3-11 provide additional characterization of conditions of concern in each tract. Census Tract 2001.04 is largely the campus and associated housing of Wright State University, which is reflected in elevated scores related to housing, socioeconomics and prevalence of children. The three tracts southwest of the proposed Gerlaugh Farm Parcel are more affected by air pollution conditions, while two of those tracts (908 and 907) exhibit more issues associated with housing, high volume roads, an elderly population, and prevalence of significant health conditions.

Children are present at WPAFB as residents and visitors. The protection of children on-base for the proposed EUL project areas would be focused on military housing and child-care facilities located in Area B. There is little military housing nearby the proposed EUL sites but there are two full-day Child Development Centers located in Area B that provide day care for children 6 weeks to 5 years old: Wright Field North Child Development Center (F/20630A) and Wright Field South Child Development Center (F/20630B). Hourly care is also offered for children 6 months to 12 years old (WPAFB, 2014). These facilities are approximately adjacent to the west of the proposed Hilltop Parcel. In general, on-base at WPAFB, precautions are taken for child safety through a number of means, including using fencing, limiting access to certain areas, and requiring adult supervision.

In the adjacent communities, the census tracts directly across National Road from the proposed Hilltop Parcel and the residential community directly west of the proposed Gerlaugh Farm Parcel (Census Tract 911) both exhibit elevated Indicators of Concern for children ("Age 17 or under") of 0.80 and 0.92 respectively.

3.14.3 Environmental Consequences

This section evaluates environmental justice concerns to include disproportionate impacts on low-income or minority populations. The construction or operation of the proposed EUL projects at WPAFB would have an adverse impact with respect to environmental justice in the surrounding metropolitan area if it would disproportionately impact minority populations or low-income populations. Impacts on identified environmental justice (minority and low-income) communities and the protection of children would be considered significant if one or more of the following would occur:

- Activities or operations substantially altering lifestyles or quality of life of WPAFB employees and their families or civilian households living near WPAFB.

- Disproportionately high and adverse environmental or human health impacts on an identified minority or low-income population that appreciably exceed those of the general population around the project area.
- Disproportionately high and adverse environmental health or safety risks to an identified population of children.

3.14.3.1 Proposed Action

To comply with EO 12898 and EO 14096, ethnicity and poverty status in the study area have been examined and compared to state and national statistics to determine if minority or low-income groups could be disproportionately affected by the proposed EUL development projects. Given the location on the Base perimeter and outside the base security fence (to be relocated at the proposed Hilltop Parcel), potential effects to on-base residents and WPAFB work force are limited to those in the immediate vicinity of the proposed Hilltop and Gerlaugh Farm Parcels. Potential effects to off-base residents and businesses are those in the census tracts in the immediate vicinity of the proposed parcels as described in Section 3.13.2. In particular, Census Tract 2001.04 is across National Road from the proposed Hilltop Parcel and has a higher proportion of minority and low-income residents along with other elevated environmental justice indicators of concern (EJIOC). The three census tracts west and southwest of the proposed Gerlaugh Farm Parcel also exhibit a range of EJIOC. Protection of children is also a concern at the nearby childcare facilities nearby and in Census Tract 2001.04 across from the proposed Hilltop Parcel, and at the adjacent Census Tract 911 parcel directly west of the proposed Gerlaugh Farm Parcel.

The principal potential impacts from construction and operation of the proposed EUL projects are described below. With the exception of socioeconomics, these potential impacts would be most noticeable in close proximity to the proposed EUL sites, which for the Hilltop site would be greatest at Census Tract 2001.04 which exhibits elevated environmental justice characteristics relative to other nearby census tracts. For each resource noted below, these potential impacts could contribute to existing EJIOC in Census Tract 2004.01 but these impacts would be incremental and lack the intensity to be considered significant.

Construction

Potential construction impacts would be temporary but would last for 1-2 years during each phase of construction, over a 6-year period at each proposed EUL site as described in Section 2.4.1. These impacts would typically be considered limited but may be considered more noteworthy in communities (Census Tracts) already burdened in these areas.

- *Traffic (see Section 3.9)* – The additional traffic generated from the construction work force, installation/connection of utilities in roadways, construction equipment

delivery/removal, and construction materials/supplies to the proposed EUL sites can be expected to have an impact on local traffic, particularly when concurrent with peak hour traffic on local roadways. Both the proposed Hilltop Parcel and Gerlaugh Farm Parcel are accessed from high volume roads (National Road and the Colonel Glenn Highway) that would be susceptible to delays from construction traffic. The selected EUL developer would need to coordinate with local traffic authorities in Beavercreek and Greene County, and in Riverside to minimize potential construction traffic impacts. Census Tract 908 southwest of the proposed Gerlaugh Farm Parcel already exhibits an EJIOC for "High Road Volume" of 0.77.

- *Noise (see Section 3.2)* – Construction noise would be generated by construction equipment and tools used on the job site, as well as by construction traffic accessing and leaving each proposed EUL site. Construction noise mitigation techniques are limited to use of exhaust silencers and low-noise/visual backup warning indicators on heavy construction equipment.
- *Air Quality (see Section 3*.4) – Potential construction air quality impacts include fugitive dust from site preparation and excavation, engine emissions from construction equipment and construction traffic accessing and leaving each proposed EUL site, and VOC emissions from use of adhesives, painting and other architectural coatings. These emissions can be minimized by use of a strong fugitive dust control program, use of low-emission construction vehicles/equipment, and low-VOC coatings. Although ACAM modeling indicates emissions from construction activities would result in negligible impacts, all six census tracts exhibit an EJI Air Pollution Index above 0.67 (three above the 0.75 criteria), three of the six exhibit EJIOC of 0.82 for ozone, and all six exhibit EJIOC of 0.84 – 0.85 for PM2.5, so local communities may be particularly sensitive to additional, though temporary, emissions.
- *Safety and Health (see Section 3*.11) – Safety and health impacts from construction activities that could affect off-site residents are primarily potential construction traffic-induced accidents, which can only be minimized as described above. Other safety and health impacts to local residents and businesses could be minimized by excluding non-construction personnel from the site using security fencing.
- *Socioeconomics (see Section 3.12)* – A limited positive effect of the proposed EUL developments is availability of temporary construction jobs near several census tracts exhibiting higher levels of unemployment and low-income levels.

Operation

Potential operation impacts from the proposed EUL development projects on environmental justice issues and communities would be permanent, but generally more limited than the construction impacts. Typically, these impacts would be considered limited but may be

considered more noteworthy in communities already burdened in these areas such as Census Tracts 2001.04, 911, 908, and 907 (see Figure 3-7).

- *Traffic (see Section 3.9)* –The principal operational impact associated with the proposed EUL developments is from daily traffic. At the proposed Hilltop Parcel, operational traffic would access the site from National Road, already a busy thoroughfare, adjacent to EJIOC-burdened Census Tract 2001.04. Particularly at full buildout, but even in Phase 1 operations, the additional rush hour traffic from office operations would require coordination with the city of Beavercreek and with Greene County to adequately mitigate traffic congestion. Proposed mitigation at Hilltop site entrances/exits should maintain existing LOS. Though operational traffic would be lower at the proposed Gerlaugh Farm Parcel, it could still aggravate "high traffic volume" conditions at nearby Census Tract 908. As noted below, this additional operational traffic would also contribute to other resources already impacted based on EJIOC.
- *Noise (see Section 3.2)* – Operational noise from the proposed EUL developments would generally be limited, with the most noticeable being traffic accessing and leaving each proposed EUL site. Although traffic noise at the proposed Gerlaugh Farm Parcel would likely be insignificant, operational traffic noise from National Road could be appreciable and add to cumulative EJIOC burden on Census Tract 2001.04.
- *Air Quality (see Section 3*.4) – Vehicle exhaust emissions from additional operational traffic associated with the proposed mixed-use development (e.g., office commuters, deliveries and services, commercial customers) would contribute incrementally to local air quality degradation. Other air quality impacts from operational sources (e.g., HVAC) would be insignificant. Although ACAM modeling indicates emissions from daily operational traffic would result in negligible impacts, all six census tracts exhibit an EJI Air Pollution index above 0.67 (three above the 0.75 criteria), three of the six exhibit EJIOC of 0.82 for ozone, and all six exhibit EJIOC of 0.84 – 0.85 for PM2.5, so local communities may be particularly sensitive to additional, though limited traffic emissions.
- *Safety and Health (see Section 3*.11) – Safety and health impacts from proposed EUL development operations that could affect off-site residents are primarily pedestrian safety and potential traffic accidents. These impacts could be minimized as described above. Roadway and development design features, such as pedestrian access improvements, traffic calming measures, and other safety considerations can mitigate potential impacts.

- *Socioeconomics (see Section 3.12)* – A limited positive effect of the proposed EUL developments is availability of a range of permanent operational jobs near several census tracts exhibiting higher levels of unemployment and low income levels.

3.14.3.2No Action Alternative

Under the No Action Alternative, WPAFB would not enter into an EUL for development of the Hilltop or Gerlaugh Farms Parcels. Therefore, no potential impacts to environmental justice communities or children would occur.

3.14.4 Cumulative Impacts

Cumulative effects would result if any other concurrent proposed projects would impact the same Census Tracts – 2001.04 near the Hilltop Parcel, and 911 or 908 near the Gerlaugh Farm Parcel – on the same EJIOCs – traffic, noise, air quality, and safety and health. Several proposed projects in the eastern portion of Area B would be conducted concurrently with proposed EUL construction at the Hilltop Parcel, including the Human Performance Wing Laboratory, the Advanced Materials Research –Laboratory – C2A, and the AFIT Research Laboratory. Construction traffic for these projects – construction equipment, supplies, and daily labor – would likely access Area B via Gate 19B and National Road, aggravating traffic conditions and associated impacts (noise, air quality, and safety and health) at Census Tract 2001.04. WPAFB may need to consider requiring construction traffic for those projects to access Area B via other gates to mitigate potential cumulative effects on Census Tract 2001.04. To the extent that these new facilities would be staffed with new hires (rather than relocated WPAFB staff), their permanent operational traffic impact would need to be included in any traffic planning and future mitigation efforts on National Road. Other projects in the southern portion of Area B would also be conducted concurrently with proposed EUL construction at the Gerlaugh Farm Parcel, primarily the Gate 22B replacement project and the F/20004 building addition. While the Gate 22B replacement project should improve local traffic conditions on the Colonel Glenn Highway and I-675 interchange (near the Gerlaugh Farm site) once fully implemented and operational, WPAFB would need to optimize traffic impact mitigation measures during construction to avoid further cumulative traffic-related impacts at Census Tracts 911 and 908.

Cumulative environmental justice impacts to traffic and associated air quality, noise and safety – primarily to Census Tract 2001.04 across National Road from the proposed Hilltop EUL development – could occur from concurrent construction traffic entering and exiting Gate 19B at National Road from other planned/programmed WPAFB Area B projects. The intensity of these impacts would depend on specific project construction periods and even short-term delivery schedules of construction equipment and supplies. WPAFB would need to mitigate these impacts by the traffic impact mitigation measures that are described above in this section. In addition, as described in Section 3.9.4, contributions of traffic increases from cumulative projects would

need to be mitigated in the design of regional future improvements. These improvements require a regional effort between WPAFB, Greene County, and ODOT.

4.0 PREPARERS

This EA has been prepared under the direction of the 88 CEG/Environmental Assets Section of the Environmental Branch in the Installation Management Division. The individuals who contributed to the preparation of this document are listed below.

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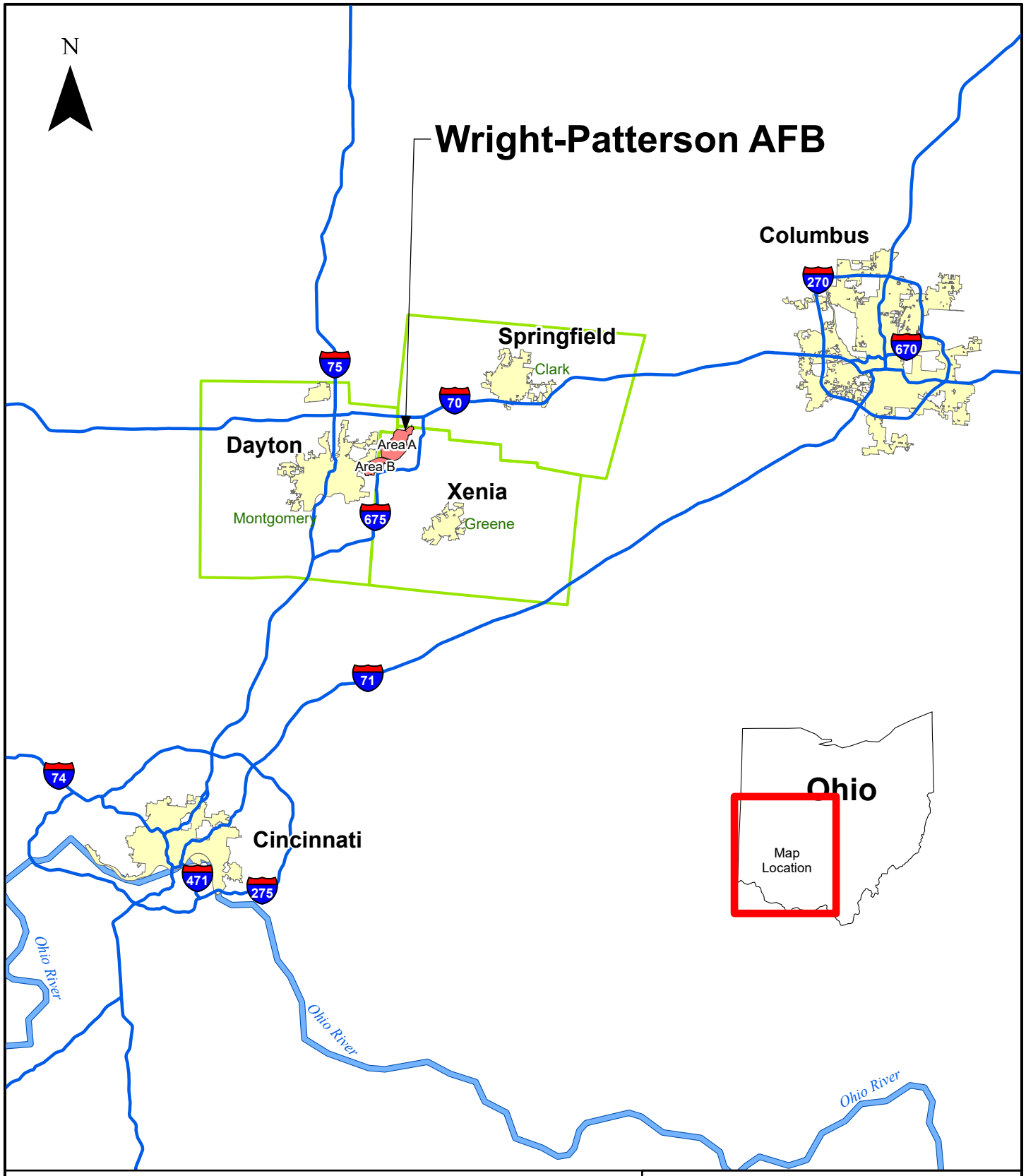
Figures



88th Air Base Wing (88 ABW)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 1-1

Location of WPAFB and Surrounding Cities

Location of WPAFB EUL Parcels

Installation Area

N

0 3,000 6,000

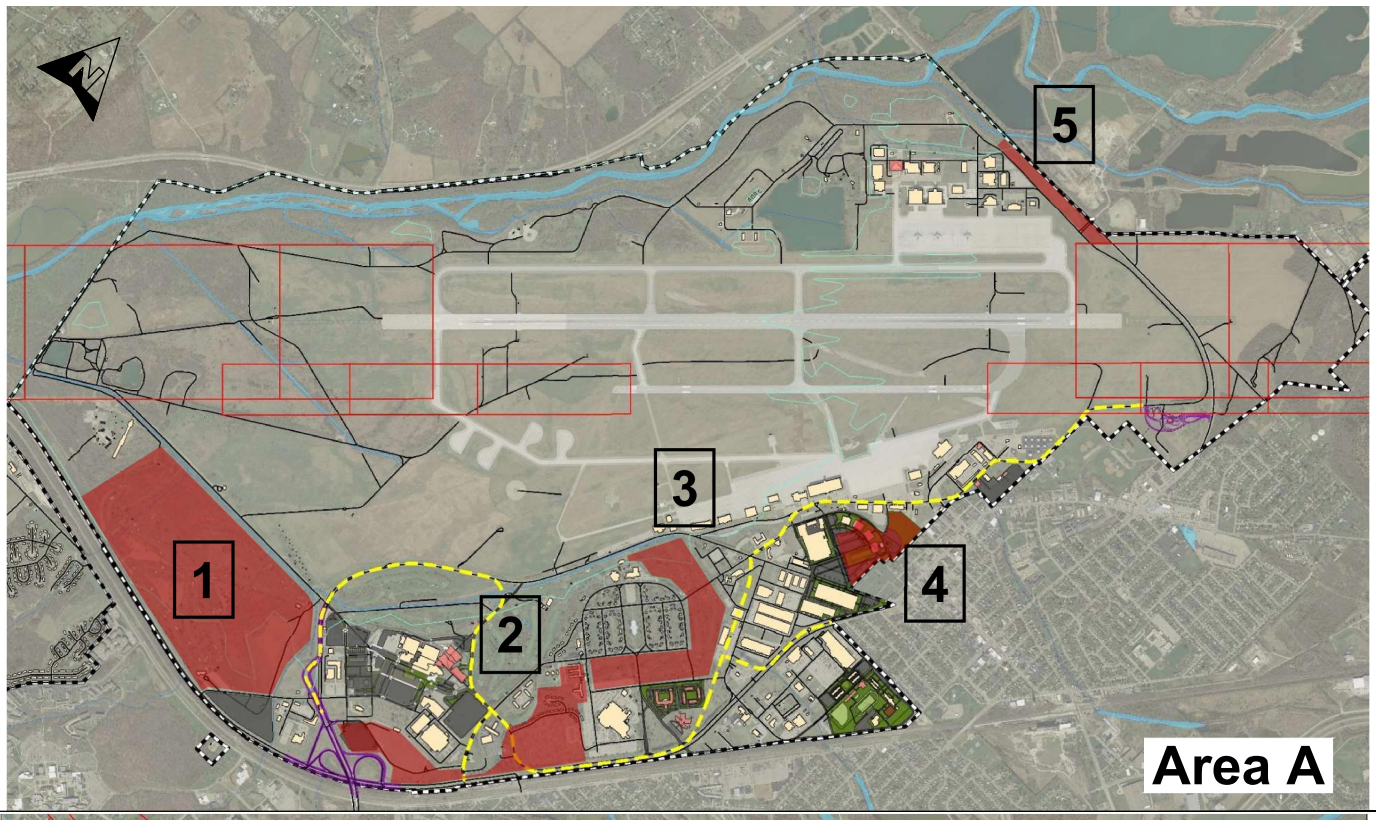
Feet

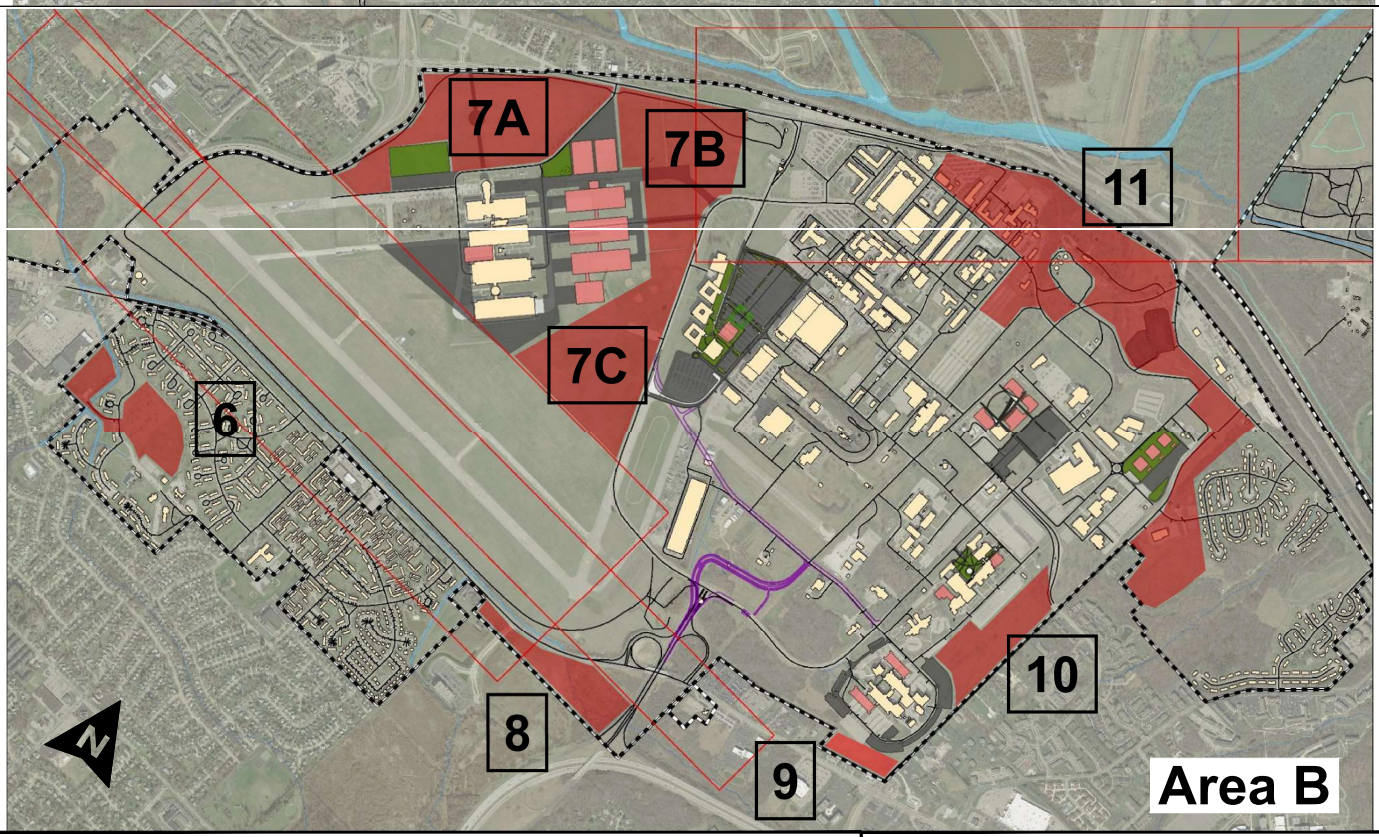
88th Air Base Wing (88 ABW)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 1-2

Location of WPAFB EUL Parcels





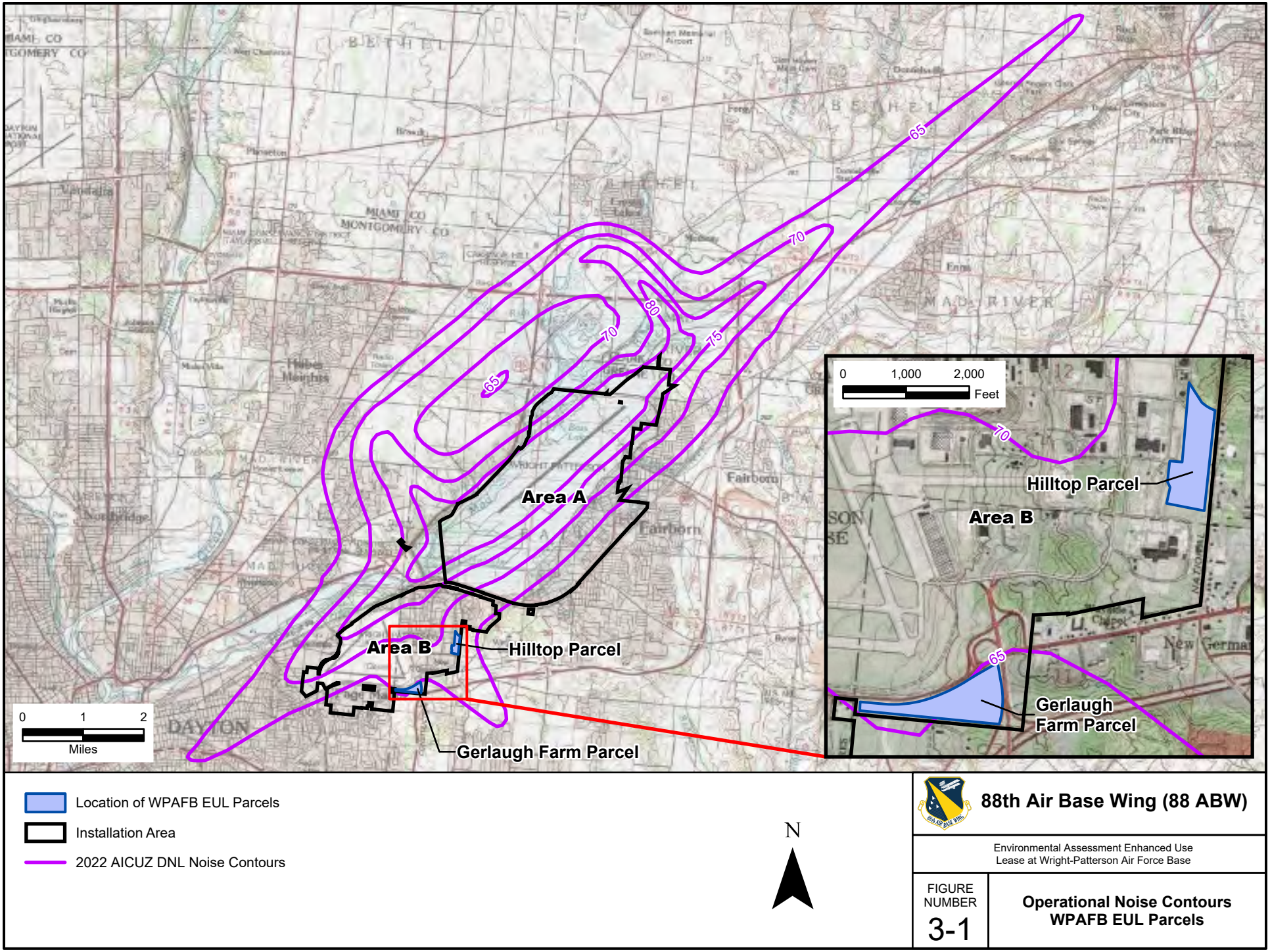
	Description:	Acreage:	Constraints:
1.	Twin Base Golf Course Site	260	Mostly in Flood Plain
2.	TLF/VQ Area and Lot 1A	100	Parking Displacement
3.	Nine-hole Golf Course Site	70	Flood Plain, Landlocked
4.	Former AFSAC Area Development	25	FEMA Support Area
5.	Along SR235 near West Ramp	13	7:1 Transitional Surface (Height Restrictions)
6.	Ball Fields (behind Airway Shopping Center)	26	Requires New Access
7.	NMUSAF Area		
	A. Northwest	70	New NMUSAF Entrance
	B. Northeast	50	NMUSAF Displays/Towpath
	C. Southeast	60	Ballfields
8.	Area near Mission Point Development	20	Height Restrictions
9.	Near Sensors Lab	5	Landlocked
10.	Near AFIT (walking trails)	26	Earthfill Disposal Zone
11.	Downtown Area B/RV Lot/Radar Barn	100	Access off Springfield, Railroad, Topography, Landfill

88th Air Base Wing (88 ABW)

Environmental Assessment Enhances Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 2-1

Potential EUL Parcels

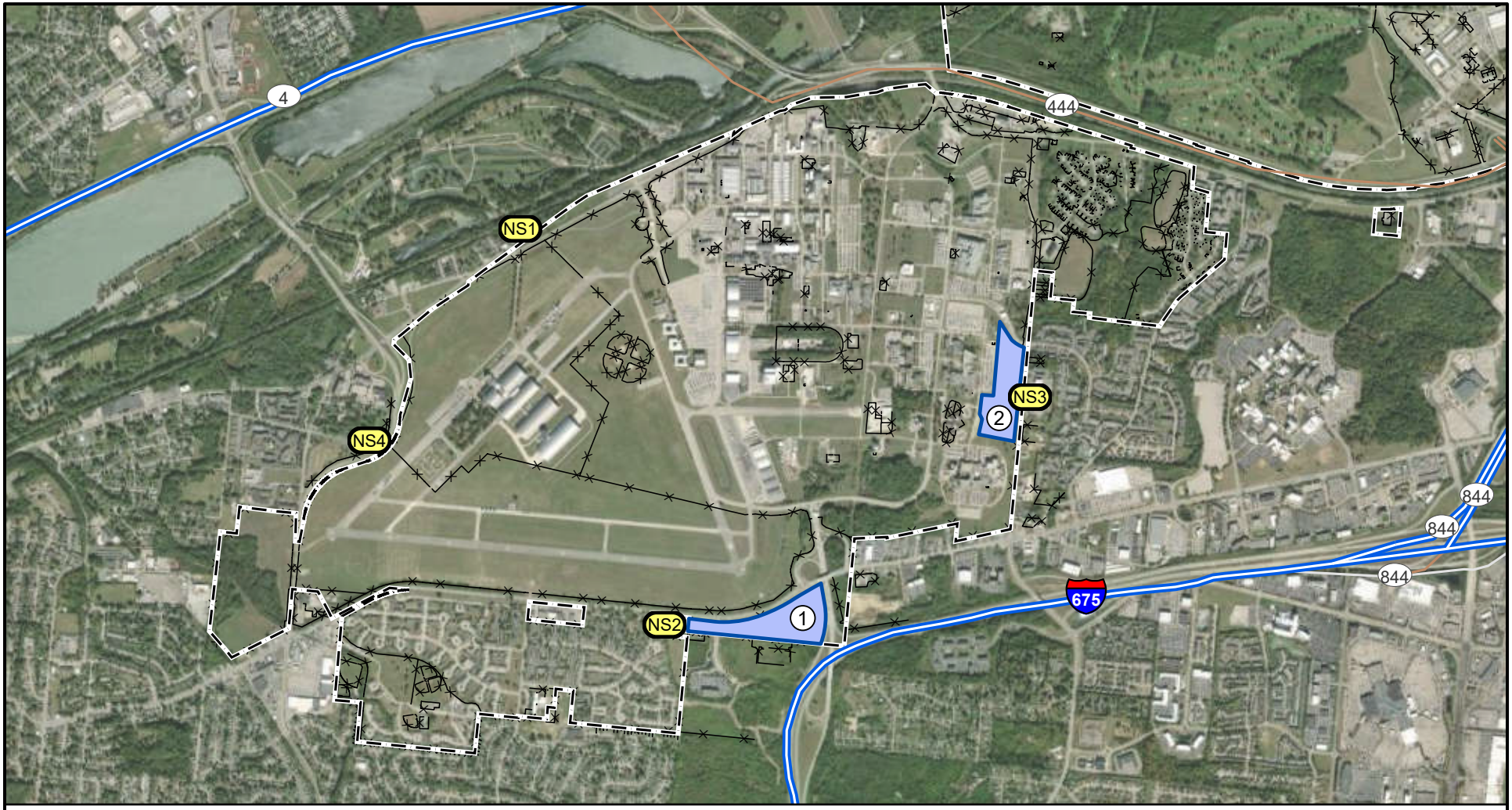


88th Air Base Wing (88 ABW)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 3-1

Operational Noise Contours WPAFB EUL Parcels



NS# Noise Sampling Locations

Wright-Patterson Air Force Base (WPAFB)

WPAFB Fence

Location of WPAFB EUL Parcels

1 Gerlaugh Property (23 Acres)

2 Hilltop Campus Area (23 Acres)

Receptor	Gerlaugh Farm	Hilltop
	Distance (feet)	Distance (feet)
NS1	7,250	8,325
NS2	474	6,234
NS3	4,751	194
NS4	6,270	10,363

N

0 1,250 2,500

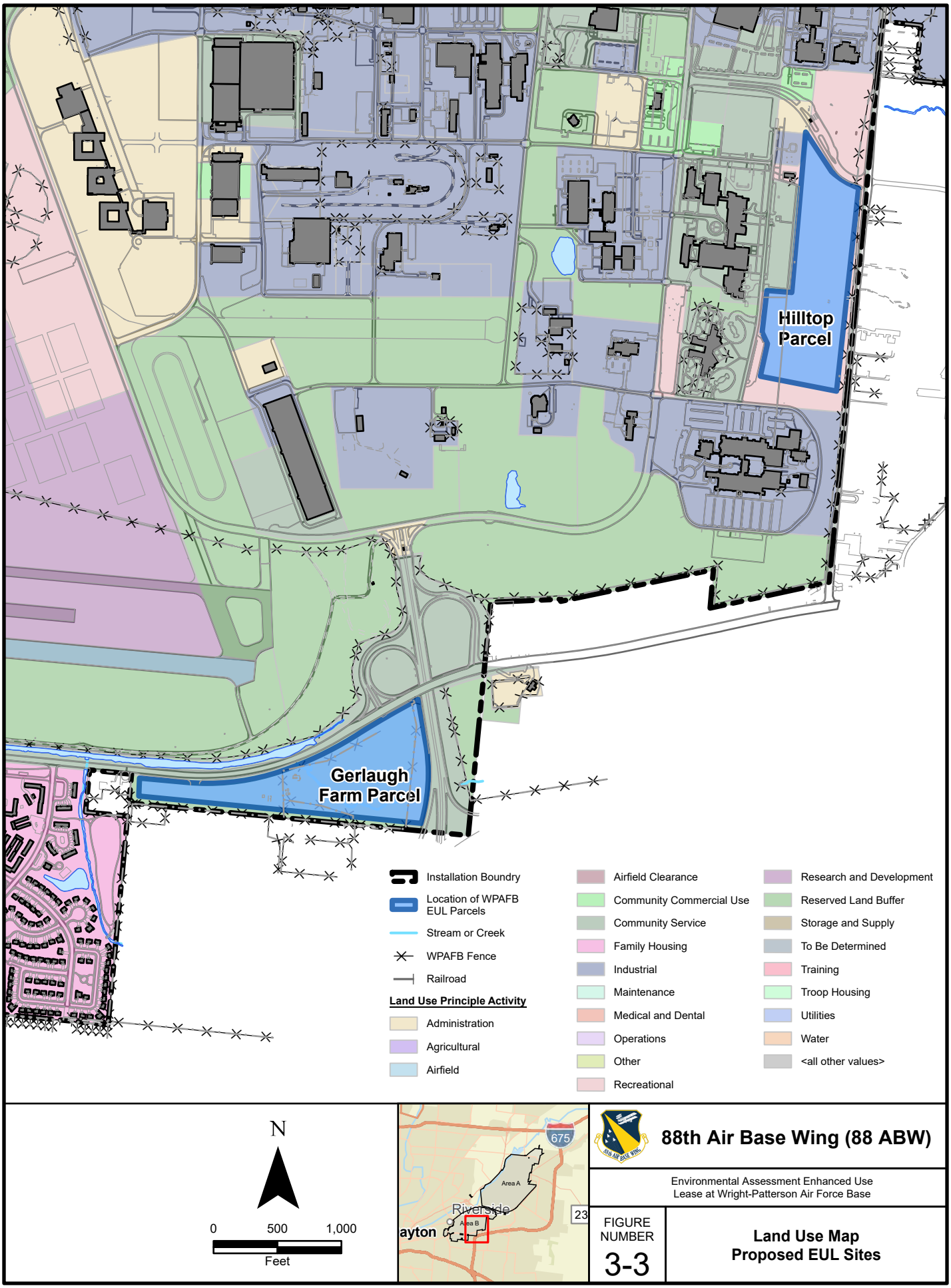
Feet

Air Force Civil Engineer Center
Installations Directorate (AFCEC/CI)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 3-2

Noise Sampling Locations

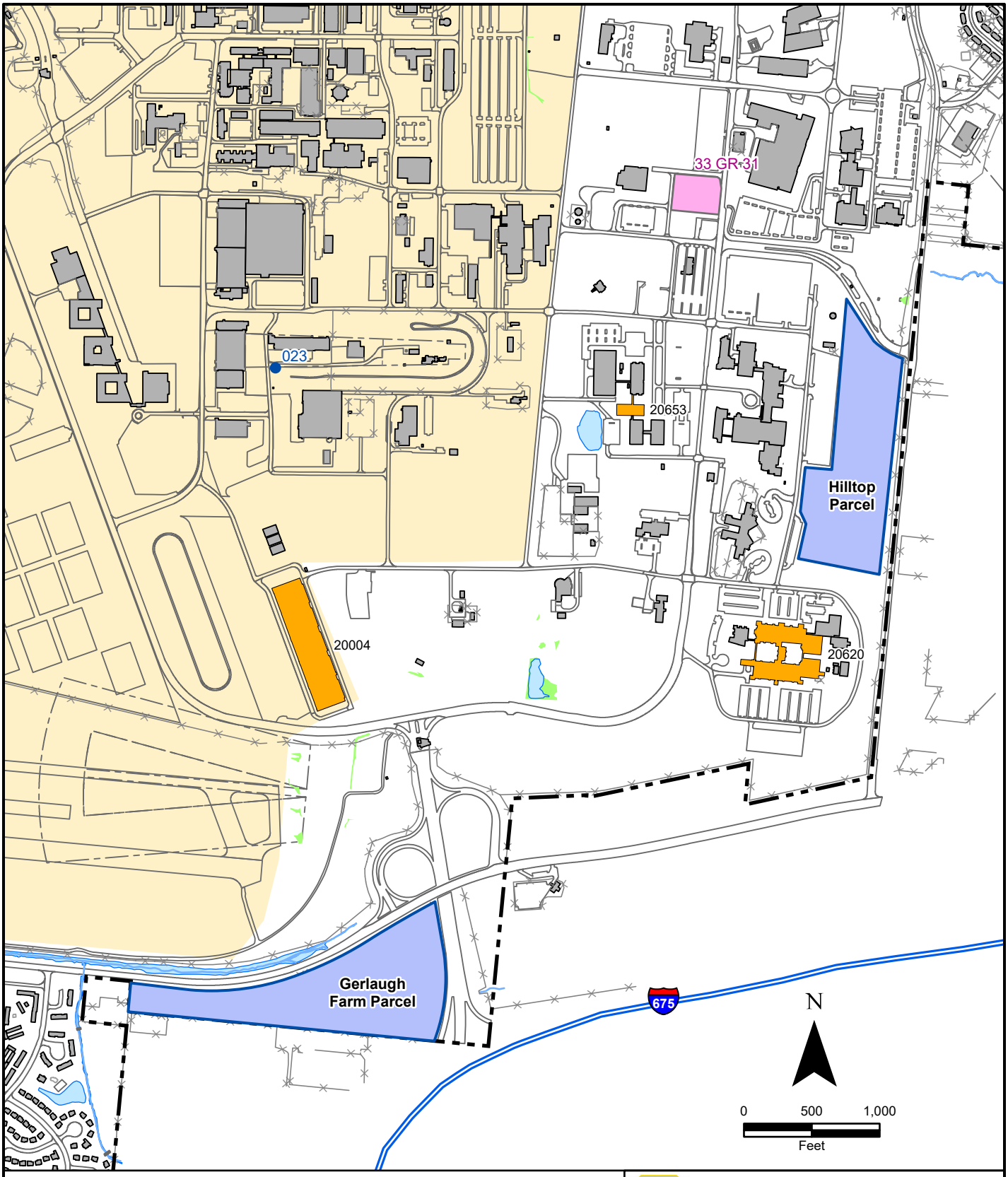


88th Air Base Wing (88 ABW)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 3-3

Land Use Map Proposed EUL Sites



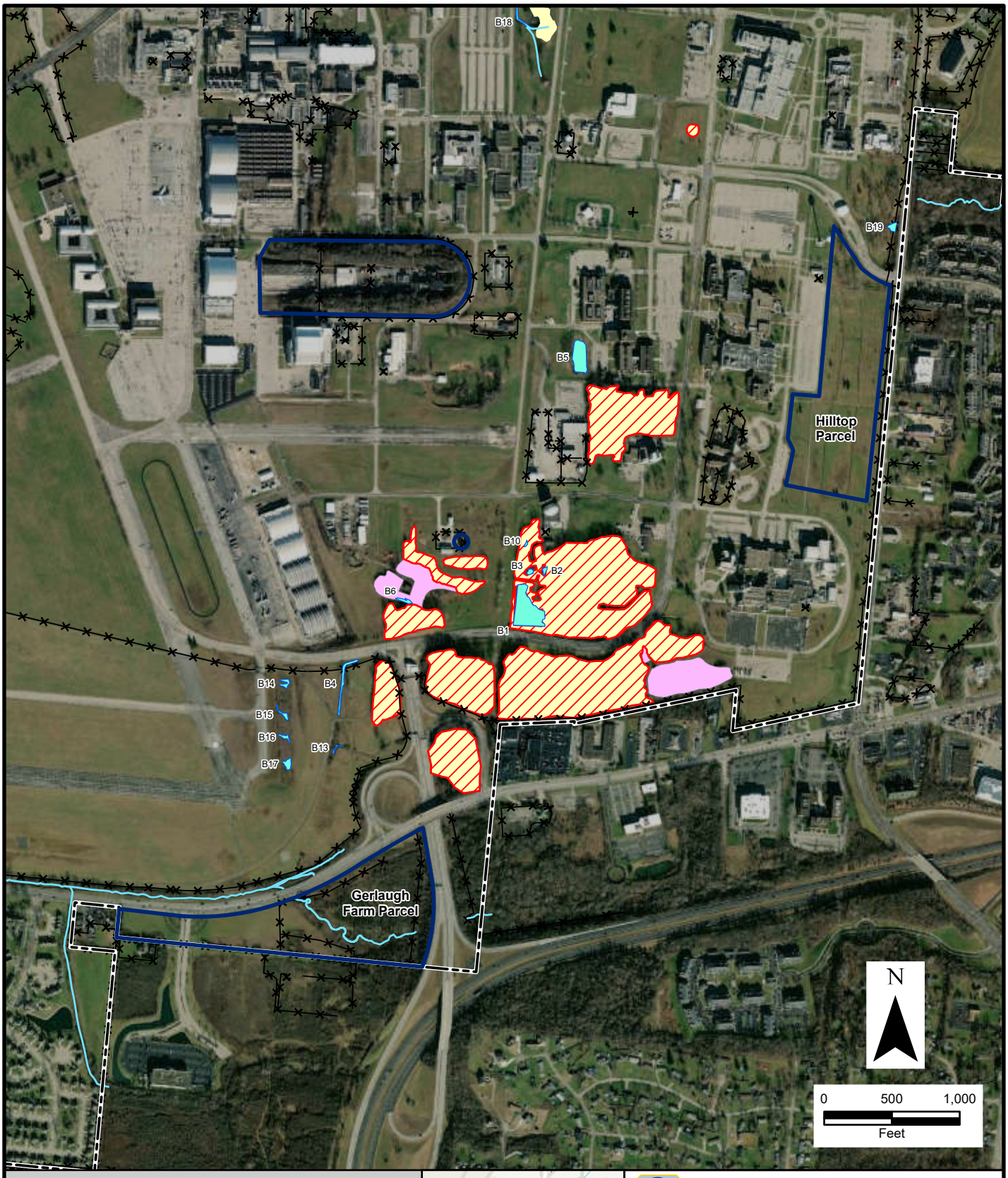
NPDES Monitoring Points
Wright-Patterson Air Force Base (WPAFB)
Location of WPAFB EUL Parcels
Prehistoric Resource Sites
Historic Landscapes
Lake or Pond
Wetlands
100-Year Floodplain
Historic Buildings
Stream
WPAFB Fence

Air Force Civil Engineer Center Installations Directorate (AFCEC/CI)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 3-4

Cultural Resources Proposed EUL Sites



Indiana Bat

Blazing Stem Star Borer

Bald Eagle

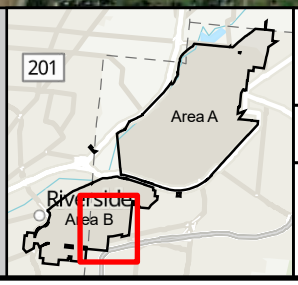
Stream or Creek

Wetlands

Installation Boundry

Location of WPAFB EUL Parcels

WPAFB Fence

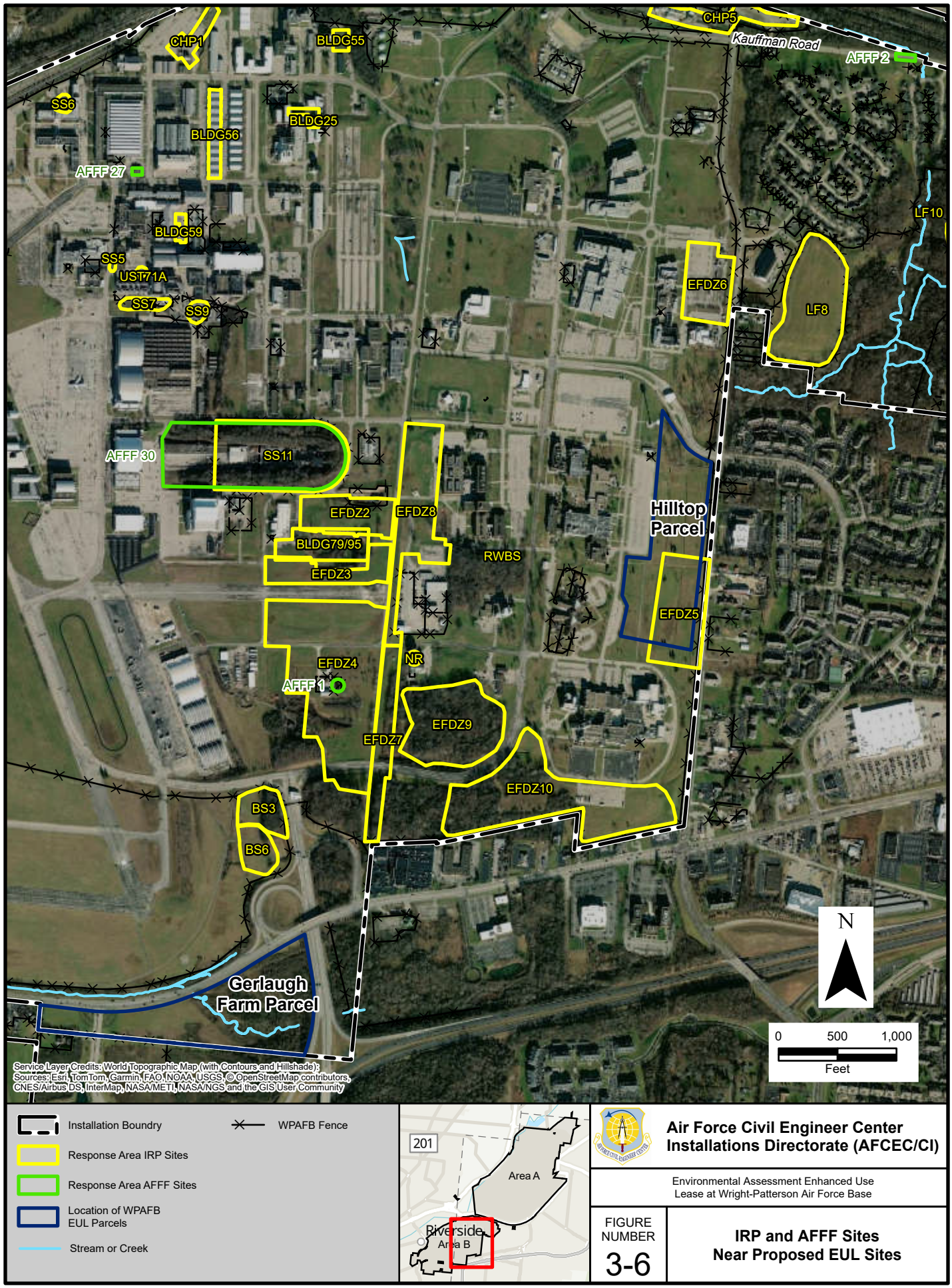


Air Force Civil Engineer Center
Installations Directorate (AFCEC/CI)

Environmental Assessment Enhanced Use
Lease at Wright-Patterson Air Force Base

FIGURE NUMBER
3-5

Threatened and Endangered Species and Wetlands Location in Area B Wright-Patterson AFB

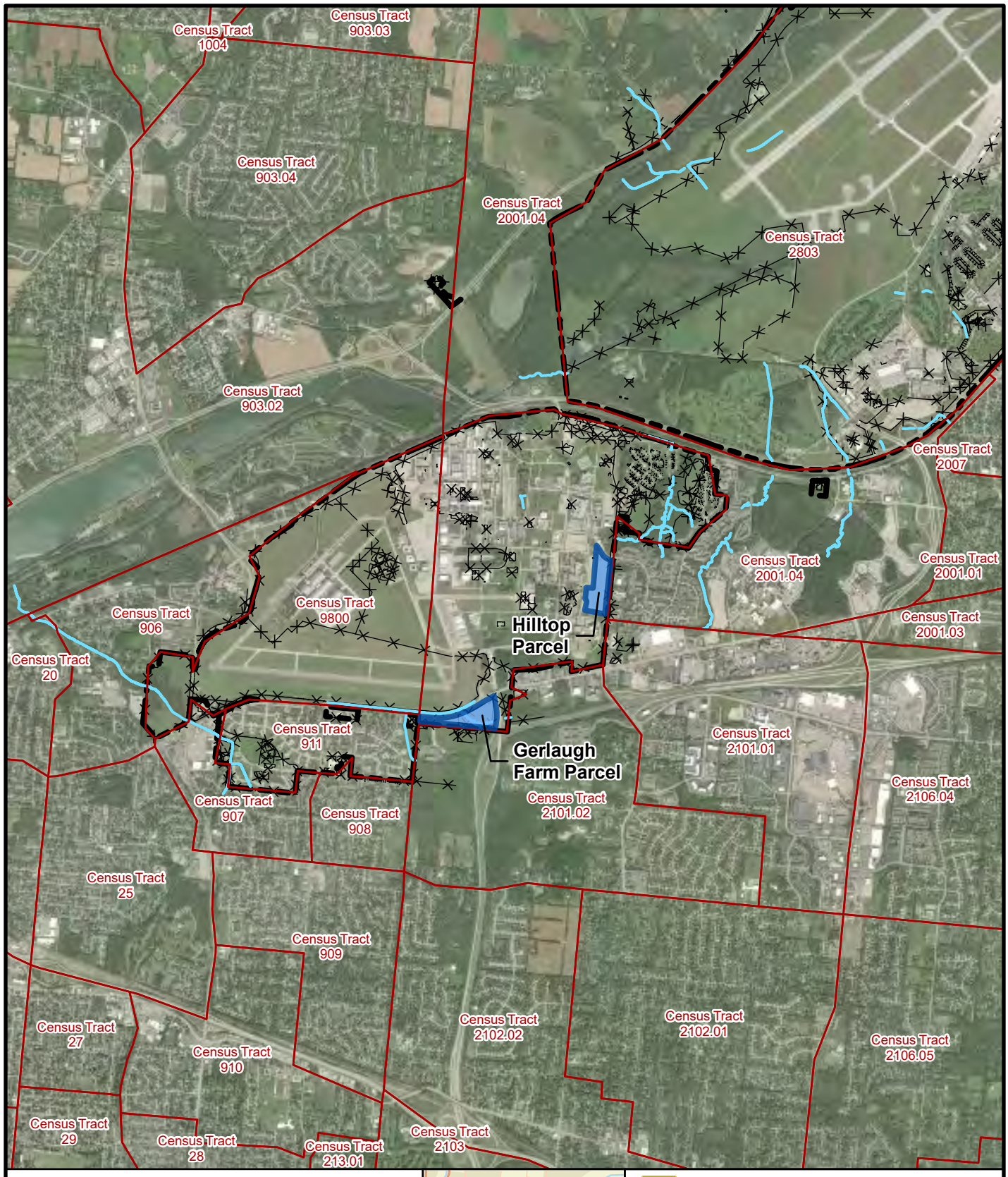


Air Force Civil Engineer Center
Installations Directorate (AFCEC/CI)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 3-6

IRP and AFFF Sites Near Proposed EUL Sites



88th Air Base Wing (88 ABW)

Environmental Assessment Enhanced Use Lease at Wright-Patterson Air Force Base

FIGURE NUMBER 3-7

Census Tracts Near Proposed EUL Sites

Tables

Table 2-1
Detailed Screening of Alternatives Against Selection Standards

Proposed Action and Alternatives	10 USC 2667 Compliant	Land Availability	Mission Compatibility	Force Protection Compatibility	Site Accessibility	Physical Compatibility	Compatible Land Use Settings for Noise
Proposed Action Site 8 (Former Gerlaugh Farm) and Site 10 (Hilltop Campus)	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of Site 8 (22 acres) is greater than 20 acres. The size of Site 10 (22 acres) is greater than 20 acres.	The mixed-use proposed for both sites is compatible with flight testing and other military and commercial missions.	Site 8 is not located on the perimeter but is near Area B. The new facilities would be contained and designed to meet the required security standards. Credentials of employees and visitors would be monitored and validated. Site 10 is located along WPAFB's perimeter security fence. Although the security fence would be moved, the new development would be located just outside the fence. Facilities would be designed to meet the required security standards. Credentials of employees and visitors would be monitored and validated.	The sites meet the criterion for accessibility.	The topography at Site 8 is suitable for construction and the site is located outside the 100-year floodplain. The topography at Site 10 is suitable for construction and the site is located outside the 100-year floodplain. Coordination would be required, and permission would need to be obtained from Ohio EPA because this location would be within the 300-foot buffer of an Earth Fill Disposal Zone (EFDZ).	The sites are compatible with land use settings for noise.
Site 1 Twin Base Golf Course	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (260 acres) is greater than 20 acres.	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions.	The site is located along WPAFB's perimeter security fence.	The site meets the criterion for accessibility.	The site is mostly in the floodplain.	The site is not compatible with commercial land use settings for noise.
Site 2 Temporary Living Quarters /Visitor Quarters and Lot 1A	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (100 acres) is greater than 20 acres.	The west side of this parcel is Lot 1A, which provides access and parking to the Visitor Center and Pass & Registration functions. It also serves as a critical connection between Gate 15 A and Gate 12A. The east side of the parcel will be occupied by housing that will be needed until the new Temporary Living Quarters/Visitor Quarters are built.	The site is located along WPAFB's perimeter security fence	The site meets the criterion for accessibility.	The topography is suitable for construction and the site is located outside the 100-year floodplain.	The site is compatible with land use settings for noise.
Site 3 Nine-hole Golf Course	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (70 acres) is greater than 20 acres.	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions	The site is in the interior of Area A adjacent to sensitive facilities (airfield operations and historic residential quarters) complicating site security for routine public access.	The site meets the criterion for accessibility.	The site is in the floodplain.	The site is not compatible with commercial land use settings for noise.
Site 4 Former AFSCAC Area Development	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (25 acres) is greater than 20 acres.	Site 4 is designated as a Federal Emergency Management Agency support area in the event of an emergency or disaster.	The site is located along WPAFB's perimeter security fence.	The site meets the criterion for accessibility.	The topography is suitable for construction and the site is located outside the 100-year floodplain	The site is compatible with land use settings for noise.

Proposed Action and Alternatives	10 USC 2667 Compliant	Land Availability	Mission Compatibility	Force Protection Compatibility	Site Accessibility	Physical Compatibility	Compatible Land Use Settings for Noise
Site 5 Along State Route 235 near West Ramp	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (13 acres) is less than 20 acres.	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions	The site is located along WPAFB's perimeter security fence; however, due to the site dimensions, there would be inadequate space for EUL development due to the required Anti-Terrorism/Force Protection (ATFP) setback distances.	The site meets the criterion for accessibility.	The northern portion of the site is located within the 100-year floodplain.	The site is not compatible with commercial land use settings for noise.
Site 6 Ball Fields (behind Airway Shopping Center)	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (26 acres) is greater than 20 acres.	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions	The site is located within The Properties at Wright Field, which is a military housing area.	New access is required. The ball fields are within The Properties at Wright Field, which is a military housing area.	The topography is suitable for construction and the site is located outside the 100-year floodplain; however, new access is required.	The site is compatible with land use settings for noise.
Site 7 National Museum of the U.S. Air Force (NMUSAF) Site 7A – Northwest Site 7B – Northeast Site 7C – Southeast	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The sizes of the sites are each greater than 20 acres. Site 7A (70 acres) Site 7B (50 acres) Site 7C (60 acres)	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions	The site is located along WPAFB's perimeter security fence.	The site meets the criterion for accessibility.	The sites are outside the 100-year floodplain, but incompatible due to: 7A – New NMUSAF entrance. Site 7B – NMUSAF displays and towpath. Site 7C – Ball fields.	The site is compatible with land use settings for noise.
Site 9 Near Sensors Lab	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (5 acres) is less than 20 acres.	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions	The site is located along WPAFB's perimeter security fence.	The site meets the criterion for accessibility.	The site is too small, but otherwise meets the Physical Compatibility standard.	The site is compatible with land use settings for noise.
Site 11 Downtown Area B, RV Lot, Radar Barn	The site was considered for EUL because it meets the criteria under 10 USC 2667.	The size of the site (100 acres) is greater than 20 acres.	The mixed-use proposed for the site is compatible with flight testing and other military and commercial missions	The site is located along WPAFB's perimeter security fence.	Site is accessible from Springfield Street.	The sites are outside the 100-year floodplain, but incompatible due to topography.	The site is compatible with land use settings for noise.
No Action Alternative	The sites under consideration would still be compliant with 10 USC 2667 under the No Action Alternative.	No change in current acreage.	The No Action Alternative would not change the compatibility of the current sites with flight testing and other military and commercial missions.	No change in force protection compatibility under the No Action Alternative.	No change in site accessibility under the No Action Alternative.	No change in current constraints under the No Action Alternative.	No change in compatibility with land use settings under the No Action Alternative.

Notes:

Meets selection standards.

Does not meet selection standards.

Table 2-2
Conceptual Hilltop Parcel Buildout Sizing

Building #	Use	Square Footage (gsf)	Building Footprint (gsf)	Total # Floors	Population/Parking Spaces	Construction Start Date
1	Office	84,000	21,000	4	252	2025
2	Retail/Restaurant	51,000	25,500	3	153	2026
4 & 6	Hotel & Office	60,000 & 45,000	20,000 & 22,500	3 & 2	315	2027
7	Office	40,000	20,000	2	120	2028
9	Office	50,000	25,000	2	150	2029
11	Office	75,000	25,000	3	225	2030

Hilltop Totals:
Square Footage (gsf) *405,000*
Population/Parking Spaces *1,215*

Table 2-3
Conceptual Gerlaugh Farm Parcel Buildout Sizing

Building #	Use	Square Footage (gsf)	Building Footprint (gsf)	Total # Floors	Population/Parking Spaces	Construction Start Date
5	Office	40,000	20,000	2	120	2031
8	Office	40,000	20,000	2	120	2032
10	Office	60,000	20,000	3	180	2033
12	Office	20,000	20,000	1	60	2034

Gerlaugh Farm Totals:
Square Footage (gsf) *160,000*
Population/Parking Spaces *480*

Table 2-4
Comparison of Environmental Consequences

Affected Environment	Proposed Action	No Action Alternative
Noise	Limited temporary impacts on the noise environment from construction activities near receptors adjacent to each site. Impacts would be limited to working hours from 7:00 AM to 7:00 PM. During operations, limited impacts from increased traffic concentrated during morning and evening rush hours to receptors along National Road at Hilltop. Minor impacts from increased traffic accessing Gerlaugh Farm from Colonel Glenn Highway and Airway Road to residences west of the site during rush hours.	No impact because there would be no change in noise sources over baseline conditions.
Land Use	Land use at the Hilltop parcel would change from Recreational to Industrial/Commercial. While there would be an insignificant loss of recreational space, the proposed mixed-use development would be generally compatible with other nearby WPAFB land use with the relocated security fence. Buildings would be designed to comply with height restrictions, which would be 90 ft for the Hilltop and 50 ft for the Gerlaugh parcel. Both parcels are generally compatible with adjacent land use and zoning classifications of the city of Beavercreek, Bath Township and city of Fairborn.	No impact because there would be no change in existing land use at the EUL parcels.
Air Quality	Emissions from the construction and operation from the proposed EUL would not exceed any Clean Air Act General Conformity de minimis Threshold or any DAF established insignificance indicators for criteria pollutants or greenhouse gases.	No impact because there would be no change in air emissions over baseline conditions.
Cultural Resources	No adverse effect because no archaeological sites or National Register of Historic Places (NRHP)-eligible buildings are located in close proximity to the proposed EUL sites. In the event of an unanticipated discovery of possible grave sites or other archaeological resources, actions detailed in the ICRMP would be initiated to minimize impacts.	No impact because there would be no ground disturbance and no NHRP-eligible buildings are present.

Affected Environment	Proposed Action	No Action Alternative
Biological Resources	The proposed EUL would result in a 1.2 percent reduction of existing vegetation across the base, which would be an insignificant impact. Disturbed areas on the proposed EUL project sites would be re-vegetated as needed. In accordance with WPAFB policy, any trees removed at either proposed EUL site would be replaced at a 3-to-1 ratio. No impact to sensitive wildlife in habitat. No known occurrences or habitat of threatened or endangered species have been identified on or near either proposed EUL site. To prevent potential impact to the federally endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), WPAFB has committed basewide to cutting all trees greater than or equal to 3 inches in diameter at breast height only between October 1 and March 31 to avoid adverse effects. The USFWS concurred with the determination that the project, as proposed, is not likely to adversely affect the federally endangered Indiana bat (*Myotis sodalis*) and the northern long-eared bat *(Myotis septentrionalis*. The ODNR also concurred that these projects were not likely to impact state threatened and endangered species.	No impact because the existing biological resources would not change over baseline conditions.
Earth Resources	No significant impacts. Both EUL parcels are relatively flat with mild slopes that would be addressed with routine engineering and construction techniques to maintain stability and prevent erosion.	No impact because there would be no change in existing soil over baseline conditions.
Water Resources	Construction and operation of new mixed-use and office developments on the proposed EUL parcels would not result in new groundwater withdrawals, so they would not affect groundwater supplies (yield) directly. For surface water, impacts would be minor because BMPs would be implemented as part of a SWPPP required by the Ohio EPA Construction General Permit and city/county requirements. Some phased developments would require a Section 404 permit under the Clean Water Act. All permits required would be the responsibility of the developer. No wetlands or floodplains are present; therefore, no impacts are expected.	No impact because there would be no change to water resources over baseline conditions.
Infrastructure	Temporary impacts during site preparation due to relocating or closing, capping, and abandoning in place existing utilities, particularly at the Hilltop EUL Parcel. All preliminary utilities disposition work would occur in areas that would already have been disturbed. The facilities at both EUL developments would use public utilities. The EUL facilities would be in developed areas with well-supported utilities and sufficient capacity for growth. The developer would contact the local providers when design details are available. Site access design features identified as a result of Traffic Studies approved by Greene County would limit traffic impacts to maintain existing levels of service. Measures to alleviate existing traffic conditions on National Road would require a regional effort to alleviate.	No impact because there would be no changes to infrastructure (utilities) or traffic over baseline conditions.

Affected Environment	Proposed Action	No Action Alternative
Hazardous Materials/Waste	Negligible impact because hazardous materials used and hazardous waste generated during construction activities would be consistent in types and quantities typical of other WPAFB construction projects. Any hazardous, toxic, recyclable, and otherwise regulated waste streams generated by DAF tenant operations would be managed through the 88th Civil Engineer Group Environmental Branch in accordance with the WPAFB Hazardous Waste Management Plan. No adverse impact to IRP sites because a soil management plan would be prepared to establish project-specific procedures for handling and disposal of soil on and in the vicinity of EFDZ 5 at the Hilltop site. WPAFB, Ohio EPA and USEPA have determined the specific regulatory procedures and approvals necessary to be completed before construction starts. This includes changing the land use from recreational to industrial/commercial in the Land Use Control Implementation Plan (LUCIP), including vapor mitigation measures, and sampling of soil removed off-base for PFAS contamination. There are no IRP sites on the Gerlaugh Farm site.	No impact because there would be no change in baseline conditions.
Safety and Health	Impacts would be insignificant. Construction workers would adhere to relevant health and safety regulations and standards. Construction of the new (relocated) WPAFB security fence would be completed before removal of the existing fence at the Hilltop site to ensure ATFP.	No impact because there would be no changes in baseline conditions.
Socioeconomics	Beneficial impact on local workforce and economy from revenue generated by construction activities as well as the creation of approximately 2,000 skilled jobs.	No impact because there would be no change in baseline conditions.
Environmental Justice	Census Tract 2001.04, directly across National Road from the Hilltop site, exhibits elevated environmental justice characteristics and would be potentially affected by construction and operation of the proposed EUL development. These potential impacts could contribute to existing environmental justice indicators of concern in Census Tract 2004.01 but these impacts would be incremental and lack the intensity to be considered significant.	No impact because there would be no change in baseline conditions.

Table 3-1
DoD Past, Present, and Reasonably Foreseeable Actions – Area B

Project Name	Description	Planned Year of Implementation	Potential Resources Affected
Acquisition Management Complex	MILCON	Fiscal Years 2026 - 2030	Noise, Air Quality, Earth Resources, Occupational Health and Safety, Traffic/Transportation Infrastructure
Gate 22B	Add/alter ECP 22B in Area B, realign road	Fiscal Years 2026 - 2030	Noise, Air Quality, Earth Resources, Occupational Health and Safety, Traffic/Transportation Infrastructure/Utilities
Human Performance Wing Laboratory	MILCON	Fiscal Year 2027 in Fiscal Years 2025 Future Years Defense Plan	Noise, Air Quality, Earth Resources, Occupational Health and Safety, Traffic/Transportation Infrastructure
Advanced Materials Research Laboratory - Consolidate to Accelerate (C2A)	MILCON	Fiscal Years 2026 - 2030	Noise, Air Quality, Earth Resources, Water Resources, Cultural Resources, Occupational Health and Safety, Hazardous Materials/Waste, Infrastructure
AFIT Research Laboratory	MILCON	Fiscal Years 2026 - 2030	Noise, Air Quality, Earth Resources, Water Resources, Occupational Health and Safety, Hazardous Materials/Waste, Infrastructure/Utilities
NMUSAF Collections Facility (Building 20004 Addition) –	MILCON	Fiscal Years 2026 - 2030	Noise, Air Quality, Cultural Resources, Occupational Safety and Health, Traffic/Transportation Infrastructure
NMUSAF Master Plan Projects	Upgrades, renovation, repairs	Fiscal Years 2024 – 2035	Noise, Air Quality, Cultural Resources, Occupational Safety and Health, Traffic/Transportation Infrastructure
F/20014 (Aircraft Research Engineering)	Demolition; Connecting Tunnel between F/20011, F/20014, and F/20015	Fiscal Year 2026	Noise, Air Quality, Earth Resources, Occupational Health and Safety, Hazardous Materials/Waste, Traffic/Transportation Infrastructure
F/20477 (Hazardous Waste Storage & Transfer)	Demolition	Fiscal Year 2027	Noise, Air Quality, Earth Resources, Occupational Health and Safety, Hazardous Materials/Waste, Traffic/Transportation Infrastructure

Project Name	Description	Planned Year of Implementation	Potential Resources Affected
F/20016 (Administrative) F/20091 (Weather Office); F/20039 (Audio-Visual Facility) F/20168 (Air University Professional/ Technical) F/20196 (Research & Development Storage Facility)	Demolition	Fiscal Year 2029	Noise, Air Quality, Earth Resources,Cultural Resources (F/20016), Occupational Health and Safety, Hazardous Materials/Waste, Traffic/Transportation Infrastructure

Table 3-2
Ambient Noise Sampling Site Data

Sampling Site No.	L_{eq} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)	Date of Sampling	Time of Day of Sampling	Weather
1	53.1	57.6	47.2	41.9	12/7/2021	1530-1630	24°F, winds 0-2.5 mph; mostly cloudy; light snow during a portion of sampling
2	62.3	65.5	61.2	53.3	12/8/2021	1055-1155	31°F; winds 2.5-4 mph; mostly clear skies
3	66.3	69.6	65.5	55.9	12/8/2021	1250-1350	37°F winds 0-6 mph; mostly clear skies
4	62.9	65.3	62.3	57.5	12/8/2021	1400-1500	38°F; winds 0-4 mph; mostly clear skies

Table 3-3
Emissions at WPAFB Associated with the Proposed Action

Air Pollutant Emissions Source	VOC Emissions (tpy)	NO_x Emissions (tpy)	CO Emissions (tpy)	PM_{10} Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)	SO_2 Emissions (tpy)	CO_2e (metric tpy)	SC GHG ($)
Calendar Year 2025	0.252	1.370	2.912	7.380	0.052	0.003	361	$29.99
Calendar Year 2026	0.967	3.223	12.010	4.579	0.112	0.010	1,330	$111.86
Calendar Year 2027	1.369	4.926	17.316	9.356	0.179	0.017	2,262	$194.91
Calendar Year 2028	1.766	5.253	22.948	3.708	0.193	0.022	3,112	$271.40
Calendar Year 2029	2.070	4.420	27.531	4.551	0.188	0.024	3,905	$344.58
Calendar Year 2030	2.296	4.718	30.606	6.761	0.205	0.027	4,425	$394.94
Calendar Year 2031	2.523	4.872	33.575	4.157	0.220	0.030	4,978	$454.31
Calendar Year 2032	2.746	5.174	36.479	4.181	0.245	0.034	5,614	$518.11
Calendar Year 2033	2.939	5.445	38.891	6.161	0.261	0.037	6,090	$574.26
Calendar Year 2034	3.066	5.353	40.502	2.245	0.271	0.038	6,457	$615.33
Calendar Year 2035	3.000	4.090	39.663	0.264	0.256	0.036	6,499	$626.13
Calendar Year 2036	2.987	3.820	39.348	0.260	0.252	0.036	6,479	$637.10
Calendar Year 2037 *	2.987	3.823	39.355	0.260	0.252	0.036	6,479	$643.81
GCR *de minimis* Threshold	100	100	N/A	N/A	N/A	N/A	N/A	N/A
DAF Insignificance Indicator	N/A	N/A	250	250	250	250	68,039	N/A
Any Threshold Exceedance?	No	No	No	No	No	No	No	No

Notes:

* *Steady state*

tpy	*tons per year*
N/A	*not applicable*

Table 3-4
State and Federal Listed Species Occurring at WPAFB

Common Name	Scientific Name	Status Federal	Status State
Indiana Bat	*Myotis sodalis*	Endangered	Endangered
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Threatened
Eastern Massasauga Rattlesnake (EMR)	*Sistrurus catenatus*	Threatened	Threatened
Clubshell (subfossil)	*Pleurobema clava*	Endangered	Endangered
Rayed Bean	*Villosa fabalis*	Threatened	Endangered
Snuffbox	*Epioblasma triquetra*	Endangered	Endangered

Source:
WPAFB 2022d, ODNR 2024, USFWS 2023

Table 3-5
Utility Service Providers

Utility	Hilltop Parcel Commercial Providers	Gerlaugh Farm Parcel Commercial Providers
Potable Water	Greene County or Fairborn	Greene County
Sanitary Sewer	Greene County or Fairborn	Greene County
Storm Sewer	Greene County or Fairborn	Greene County
Electricity	AES	AES
Natural Gas	Centerpoint	Centerpoint
Fire Protection Water	Greene County or Fairborn	Greene County

Table 3-6
Existing (2025) National Road Traffic Ratings

Intersection	Level-of-Service Rating AM Peak	Level-of-Service Rating PM Peak
Colonel Glenn Highway	D	D
Gate 19B/Reese Road	E	D
Kauffman Road	C	E

Table 3-7
IRP Sites in the Vicinity of the Hilltop Project Site

Operable Unit	IRP Site(s)	IRP Description	Allowable Land Use*
OU 9	EFDZ 5	Historical earthfill disposal sites landfills in operation from the 1940s through the 1960s; EFDZ 5 located on Hilltop Parcel. Other EFDZs are located over 1,000 feet from parcel north of the property.	2
	EFDZ 6		2
	EFDZ 8		2
	EFDZ 9		2
	EFDZ 10		2

Notes:

** 1 = No digging, building, construction, etc. or otherwise disturbing landfill cover; may require an Ohio EPA application of authority to disturb area within 300 foot boundary of an EFDZ; 2 = Digging, construction, and other soil disturbances allowable after approval by AFCEC/CZOM personnel; area subject to use restriction; may require an Ohio EPA application of authority to disturb area within 300 foot boundary of an EFDZ ; 3 = Digging, construction, and other soil disturbance is allowable only after approval by AFCEC/CZOM personnel; area subject to use restriction. 4 = Public water supply wells will require approval from state of Ohio prior to installation. WPAFB, as an active military installation, will control installation of private wells (WPAFB, 2019).*

Table 3-8
IRP Sites in the Vicinity of the Gerlaugh Farm Project Site

Operable Unit	IRP Site(s)	IRP Description	Allowable Land Use*
OU9	Burial Site (BS) 3 BS 6	Historical burial sites located approximately 1,000 feet northeast of the Gerlaugh Farm Parcel.	2 2

Notes:

** 1 = No digging, building, construction, etc. or otherwise disturbing landfill cover; may require an Ohio EPA application of authority to disturb area within 300 foot boundary of an EFDZ; 2 = Digging, construction, and other soil disturbances allowable after approval by AFCEC/CZOM personnel; area subject to use restriction; may require an Ohio EPA application of authority to disturb area within 300 foot boundary of an EFDZ ; 3 = Digging, construction, and other soil disturbance is allowable only after approval by AFCEC/CZOM personnel; area subject to use restriction. 4 = Public water supply wells will require approval from state of Ohio prior to installation. WPAFB, as an active military installation, will control installation of private wells (WPAFB, 2019).*

Table 3-9
WPAFB Economic and Demographic Characteristics Compared to the Surrounding Communities Using Census Bureau 5-Year Estimates

Census Tract: 2803, Area: WPAFB – Areas A & B

Subject	Estimate	Percent
Total Population	1,871	100
Male	nr	53.2
Female	nr	46.8
White	nr	64.4
Black	nr	22.4
Hispanic	nr	7.8
Asian	nr	3.5
Other	nr	1.9
Median Age	22	na
Percent Under 18 years	na	25.0
Employed	nr	34.5
Under Poverty Threshold – Families	nr	7.4
Median Household Income (dollars)	64,063	nr

Statewide Reference Point: State Of Ohio

Subject	Estimate	Percent
Total Population	11.8M	100
Male	5.8M	49.3
Female	6.0M	50.7
White	9.4M	79.6
Black	1.5M	12.3
Hispanic	0.5M	4.1
Asian	0.3M	2.4
Other	0.1M	1.6
Median Age	39.4	na
Percent Under 18 years	2.6M	22.3
Employed	5.7M	59.9
Unemployed	0.3M	3.3
Under Poverty Threshold – Families	625.9K	na
Total Household Income $75,000 to $99,999	na	13.2
Median Household Income (dollars)	61,938	na

Census Tract: 2001.04, Area: East of Area B/ Hilltop EUL Parcel

Subject	Estimate	Percent
Total Population	5,665	100
Male	nr	54.5
Female	nr	45.5
White	nr	71.8
Black	nr	15.6
Hispanic	nr	5.7
Asian	nr	4.8
Other	nr	2.1
Median Age	22.2	na
Percent Under 18 years	nr	2.5
Employed	nr	57.8
Under Poverty Threshold – Families	nr	36.5
Median Household Income (dollars)	36,962	na

Census Tract: 2101.01, Area: Southeast of Area B & Hilltop EUL Parcel

Subject	Estimate	Percent
Total Population	3,231	100
Male	nr	45.0
Female	nr	55.0
White	nr	81.2
Black	nr	3.3
Hispanic	nr	4.7
Asian	nr	8.6
Other	nr	2.2
Median Age	34.5	Na
Percent Under 18 years	nr	11.7
Employed	nr	70.3
Under Poverty Threshold – Families	nr	3.6
Median Household Income (dollars)	97,538	na

Census Tract: 2101.02, Area: South of Area B & EUL Parcels

Subject	Estimate	Percent
Total Population	2,311	100
Male	nr	56.5
Female	nr	43.5
White	nr	78.6
Black	nr	4.8
Hispanic	nr	1.4
Asian	nr	2.9
Other	nr	12.3
Median Age	31.6	na
Percent Under 18 years	nr	25.0
Employed	nr	54.5
Under Poverty Threshold – Families	nr	8.5
Median Household Income (dollars)	88,578	na

Census Tract: 911, Area: West of Gerlaugh Farm EUL Parcel

Subject	Estimate	Percent
Total Population	2,786	100
Male	nr	48.2
Female	nr	51.8
White	nr	87.1
Black	nr	7.0
Hispanic	nr	5.9
Asian	nr	3.2
Other	nr	0.6
Median Age	26.1	na
Percent Under 18 years	nr	29.6
Employed	nr	42.2
Under Poverty Threshold – Families	nr	1.7
Median Household Income (dollars)	65,284	na

Census Tract: 908, Area: Southwest of Gerlaugh Farm EUL Parcel

Subject	Estimate	Percent
Total Population	1,443	100
Male	nr	49.1
Female	nr	50.9
White	nr	95.1
Black	nr	1.0
Hispanic	nr	0.0
Asian	nr	0.0
Other	nr	3.9
Median Age	43.2	na
Percent Under 18 years	nr	23.5
Employed	nr	54.1
Under Poverty Threshold – Families	nr	15.9
Median Household Income (dollars)	54,250	na

Census Tract: 907, Area: Southwest of Gerlaugh Farm EUL Parcel

Subject	Estimate	Percent
Total Population	1,286	100
Male	nr	46.9
Female	nr	53.1
White	nr	81.2
Black	nr	3.7
Hispanic	nr	5.7
Asian	nr	3.3
Other	nr	6.1
Median Age	45.1	na
Percent Under 18 years	nr	17.7
Employed	nr	57.7
Under Poverty Threshold – Families	nr	21.4
Median Household Income (dollars)	49,366	na

Notes:

nr *nor reported*

na *not applicable*

Table 3-10
2022 Environmental Justice Index Ranks by Census Tract

Attribute	Tract 2803	Tract 2001.04	Tract 2101	Tract 911	Tract 908	Tract 907
Total Population	2,401	5,703	5,330	3,064	1,411	1,273
EJI Rank	0.62	0.78	0.15	0.34	0.62	0.69
Environmental Burden Rank	0.99	0.88	0.45	0.49	0.55	0.61
Social Vulnerability Rank	0.29	0.59	0.19	0.29	0.34	0.43
Air Pollution	0.67	0.69	0.72	0.76	0.77	0.76
Potentially Hazardous & Toxic Sites	1.00	0.89	0.00	0.36	0.00	0.40
Built Environment	0.72	0.19	0.25	0.05	0.64	0.39
Transportation Infrastructure	0.51	0.57	0.47	0.40	0.32	0.30
Water Pollution	0.91	0.91	0.91	0.91	0.91	0.91
Racial/Ethnic Minority Status	0.59	0.50	0.52	0.57	0.11	0.37
Socioeconomic Status	0.36	0.77	0.30	0.27	0.32	0.47
Household Characteristics	0.05	0.01	0.06	0.46	0.88	0.94
Housing Type	0.64	0.96	0.24	0.28	0.29	0.00
Pre-existing Chronic Disease Burden	1 of 5	2 of 5	0 of 5	1 of 5	3 of 5	3 of 5

Notes:

Values highlighted indicate a score greater than (>) 0.75, or the top quartile of census tracts included in the EJI nationwide.

Source: CDC/ATSDR Environmental Justice Index (EJI) Explorer (https://onemap.cdc.gov/portal/apps/sites/#/eji-explorer), accessed August 15–16, 2023, and updated January 18–19, 2024.

Table 3-11
Environmental, Socioeconomic and Health Indicators of Concern

Tract	Indicators of Concern		Tract	Indicators of Concern	
2803	PM2.5	0.84	911	Ozone	0.82
	National Priority List Sites	0.97		PM2.5	0.85
	Treatment, Storage & Disposal Sites	0.96		Impaired Surface Water	0.91
	Impaired Surface Water	0.91		Housing Tenure	0.99
	Housing Tenure	0.99		Age 17 and Younger	0.92
	Age 17 and Younger	0.80		*High Estimated Prevalence of Poor Mental Health*	
	Group Quarters	0.98			
	High Estimated Prevalence of Poor Mental Health				
2001.04	PM2.5	0.84	908	Ozone	0.82
	Housing Built Pre-1980	0.89		PM2.5	0.85
	Lack of Walkability	0.80		Impaired Surface Water	0.91
	Impaired Surface Water	0.91		Housing Built Pre-1980	0.94
	Poverty	0.77		High-Volume Roads	0.77
	Unemployment	0.93		Age 65 and Older	0.92
	Housing Tenure	0.82		*High Estimated Prevalence of Cancer*	
	Age 17 and younger	0.80		*High Estimated Prevalence of Diabetes*	
	High Estimated Prevalence of Poor Mental Health			*High Estimated Prevalence of Poor Mental Health*	
2101	PM2.5	0.84	907	Ozone	0.82
	Impaired Surface Water	0.91		PM2.5	0.85
	Housing Tenure	0.88		Impaired Surface Water	0.91
				Housing Built Pre-1980	0.95
				Age 65 and Older	0.79
				Speaks English “Less than Well”	0.80
				High Estimated Prevalence of Cancer	
				High Estimated Prevalence of Diabetes	
				High Estimated Prevalence of Poor Mental Health	

Appendix A
Agency Consultation Letters

State Historic Preservation Office (SHPO) ***Consultation***

SHPO Response – 3 Jan 24

January 3, 2024

In reply, please refer to:
2023-GRE-59817

Steven Byington, Architect
Cultural Resources Manager
88 CEG/CEIEA
1450 Littrell Road
Wright-Patterson Air Force Base, Ohio 45433

RE: Enhanced Use Lease (EUL) Agreement
Wright-Patterson Air Force Base, Greene County, Ohio

Dear Mr. Byington:

This letter is in response to correspondence received on December 1, 2023. Our comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

Wright-Patterson Air Force Base (WPAFB) is proposing to enter into an Enhanced Use Lease (EUL) agreement for future development of two parcels of Wright-Patterson Air Force Base (WPAFB) property. The proposed EUL is expected to enhance the value of these unused parcels to complement existing and future Air Force, Space Force, and other WPAFB tenant operations.

Based on the information provided, there are no National Register of Historic Places (NRHP) eligible buildings or archaeological resources located in immediate proximity to either of the proposed project locations. We concur that the proposed action will have no adverse effect on historic properties. No further coordination with this office is necessary, unless the project changes.

Ohio Department of Natural Resources Consultation

ODNR Response – 12 Jan 24

Office of Real Estate
Tara Paciorek, Chief
2045 Morse Road – Bldg. E-2
Columbus, Ohio 43229
Phone: (614) 265-6661
Fax: (614) 267-4764

January 12, 2024

Darryn Warner
United States Air Force
1450 Littrell Road, Building 22
Wright-Patterson Air Force Base, Ohio 45433-5209

Re: 23-1471_Wright Patterson Air Force Base Parcel Development

Project: The proposed project involves the future development of two parcels of land on the Wright Patterson Airforce Base property.

Location: The proposed project is located in Bath Township of Greene County, and the City of Dayton of Montgomery County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state, or federal agency nor relieve the applicant of the obligation to comply with any local, state, or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following data within one mile of the project area:

Blanchard's Cricket Frog (*Acris blanchardi*), SC
Indiana Myotis (*Myotis sodalis*), E, FE
Eastern Massasauga (*Sistrurus catenatus*), E, FT
Paiute Dancer (*Argia alberta*), T

Conservation status abbreviations are as follows: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; U = state status under review; X = presumed extirpated in Ohio; FE = federally endangered, and FT = federally threatened.

The review was performed on the specified project area as well as an additional one-mile radius. Records searched date from 1980. Features searched include locations of rare and endangered plants and animals determined to be of value to the conservation of their species, high quality plant communities, animal breeding assemblages, and outstanding geological features.

The species listed above are not recorded within the boundaries of the specified project area. However, please note that Ohio has not been completely surveyed and we rely on receiving information from many

sources. Therefore, a lack of records for an area is not a statement that rare species or unique features are absent from that area.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that Best Management Practices be utilized to minimize erosion and sedimentation.

The project is within the vicinity of records for the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, and the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally endangered species. Because presence of state endangered bat species has been established in the area, summer tree cutting is not recommended, and additional summer surveys would not constitute presence/absence in the area. However, limited summer tree cutting inside this buffer may be acceptable after further consultation with DOW (contact Eileen Wyza at Eileen.Wyza@dnr.ohio.gov).

In addition, the entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally endangered species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these bat species predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. The DOW recommends tree cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH ≥ 20 if possible.

The DOW also recommends that a desktop habitat assessment is conducted, followed by a field assessment if needed, to determine if a potential hibernaculum is present within the project area. Direction on how to conduct habitat assessments can be found in the current USFWS "*RANGE-WIDE INDIANA BAT & NORTHERN LONG-EARED BAT SURVEY GUIDELINES*." If a habitat assessment finds that a potential hibernaculum is present within 0.25 miles of the project area, please send this information to Eileen Wyza for project recommendations. If a potential or known hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with the DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The project is within the range of the following listed mussel species.

Federally Endangered
clubshell (*Pleurobema clava*)
snuffbox (*Epioblasma triquetra*)
rayed bean (*Villosa fabalis*)

Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the tonguetied minnow (*Exoglossum laurae*), a state threatened fish. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact this species.

The project is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and a federally threatened snake species. The eastern massasauga uses a range of habitats including wet prairies, fens, and other wetlands, as well as adjacent drier upland habitat. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species. This secretive species prefers wet fields and meadows. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the US Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project.

ODNR appreciates the opportunity to provide these comments. Please contact Mike Pettegrew at mike.pettegrew@dnr.ohio.gov if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator

U.S. Fish and Wildlife Service Consultation

USFWS Response – 13 Dec 23

USFWS Report of Wetland Assessment and Stream Headwater Habitat Evaluation – 14 Feb 24

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

December 13, 2023

Project Code: 2024-0020610

Dear Darryn Warner:

The U.S. Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse effects to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

The Service has reviewed your project description and concurs with your determination that the project, as proposed, is not likely to adversely affect the federally endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). This is based on the commitment to cut all trees ≥3 inches diameter at breast height only between October 1 and March 31 in order to avoid adverse effects to the Indiana bat and northern long-eared bat.

This concludes consultation on this action as required by section 7(a)(2) of the ESA. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be reinitiated to assess whether the determinations are still valid.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Scott Hicks

Scott Hicks
Acting Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Eileen Wyza, ODNR-DOW

Report of Wetland Assessment and Stream Headwater Habitat Evaluation for the Gerlaugh Parcel, Wright Patterson Air Force Base

To: Darryn Warner, WPAFB

From: Jeromy Applegate, USFWS

Date: February 14, 2024

On February 9, 2024, I conducted an on-site review of the entire area of investigation (Figure 1) of the Gerlaugh Parcel on Wright Patterson Air Force Base. The purpose of the review was to determine whether any wetlands are present and to conduct a Headwater Habitat Evaluation Index (HHEI) assessment of the only stream on site, Stream SB6 (Lilly Creek).

Wetland Determination

I walked the entire site looking for wetland hydrology and wetland vegetation. I found no wetland hydrology. Aside from approximately 5 small patches (each < 1 meter^2) of *Phragmites australis* (Giant Reed), I saw no wetland vegetation. The patches of Giant Reed were growing adjacent to the gas line right of way along Colonel Glen Highway. Although Giant Reed does grow in wetlands, it also grows in uplands in disturbed areas such as the gas line right of way. There was no wetland hydrology present and the Giant Reeds were growing completely in upland areas. It is my professional opinion that there are no wetlands present in the investigation area outlined in red in Figure 1.

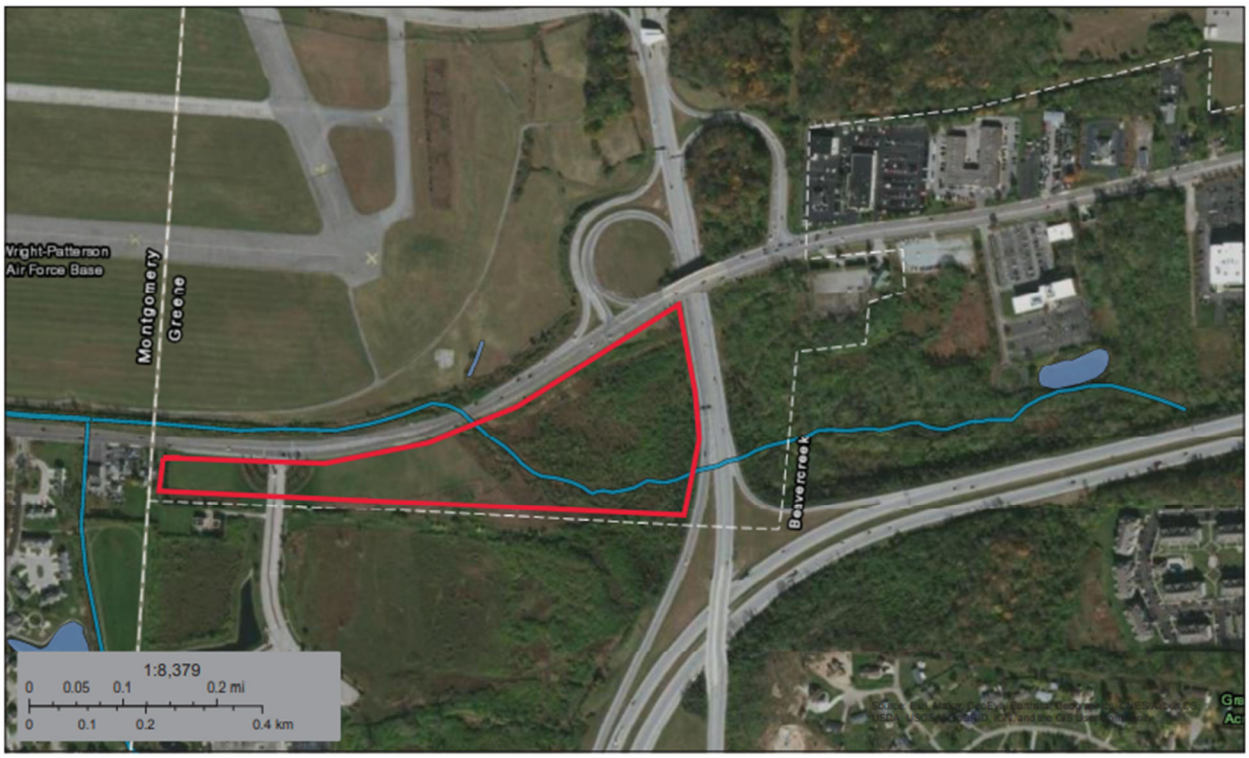


Figure 1. Area of investigation (red polygon) of the Gerlaugh Parcel, Wright Patterson Air Force Base, Ohio.

Headwater Habitat Evaluation, Stream SB6

I conducted an HHEI assessment following the procedures in OEPA's Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams (2009) on Stream SB6 at the location identified in Figure 2. The stream scored 63 on the HHEI (Appendix A), indicating that it is a Class II intermittent or perennial Primary Headwater Habitat stream. Because of the size of the stream (3.34 meters wide), the depth of the pools (maximum of 38 cm), the presence of fish, and fact that the stream was flowing at the time of my assessment even though the previous rain was 11 days prior, I believe that stream SB6 exhibits perennial flow. A site visit during the dry period of the year (i.e., September) could confirm whether it is a perennial or intermittent stream. Regardless of whether Stream SB6 is categorized as perennial or intermittent, it is likely to be regulated by both the U.S. Army Corps of Engineers (USACE) and the Ohio EPA. Any fill (e.g., culvert, bank stabilization) in Stream SB6 would likely require a permit from USACE and Ohio EPA.

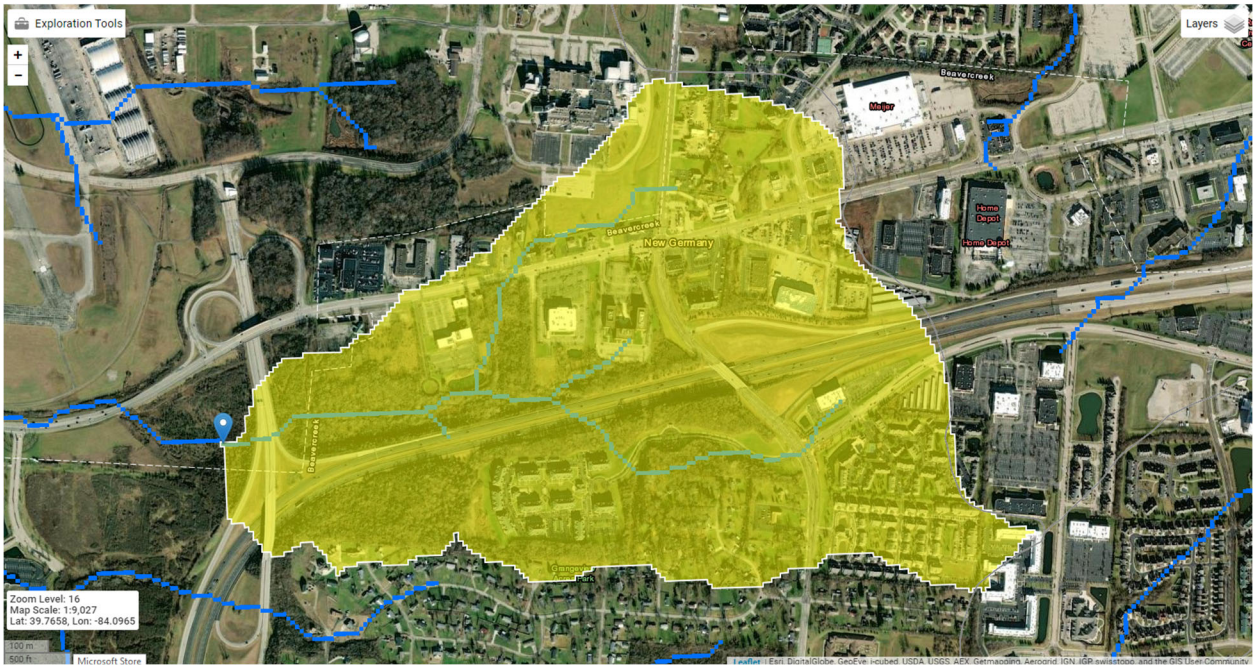


Figure 2. Location of Headwater Habitat Evaluation Index (HHEI) assessment (blue marker) and watershed of the assessment location (yellow shading) (Source: StreamStats, USGS).

Appendix A, Headwater Habitat Evaluation Index Scoring Sheet for Stream SB6

Headwater Habitat Evaluation Index Field Form

Ohio Environmental Protection Agency

HHEI Score (sum of metrics 1+2+3) 63

SITE NAME/LOCATION Gerlaugh Parcel, Stream SB6, Lilly Creek, WPAFB
SITE NUMBER ——— RIVER BASIN Mad River RIVER CODE ——— DRAINAGE AREA (mi²) 0.56
LENGTH OF STREAM REACH (ft) 200 LAT 39°46' 13.16" LONG -84° 5' 30.07" RIVER MILE ———
DATE 2/9/24 SCORER JD COMMENTS ———

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pt]**	
☐	BOULDER (>256 mm) **[16 pts]**		☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	10	☐	CLAY or HARDPAN **[0 pt]**	
☒	GRAVEL (2-64 mm) **[9 pts]**	40	☐	MUCK **[0 pts]**	
☒	SAND (<2 mm) **[6 pts]**	50	☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock ———

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 15 **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 3

HHEI Metric Points
Substrate Max = 40
18
A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61 meter (200 feet)* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☒ > 30 centimeters **[20 pts]**
☐ > 22.5 - 30 cm **[30 pts]**
☐ > 10 - 22.5 cm **[25 pts]**
☐ 5 cm - 10 cm **[15 pts]**
☐ < 5 cm **[5pts]**
☐ NO WATER OR MOIST CHANNEL **[0pts]**

COMMENTS ——— **MAXIMUM POOL DEPTH (centimeters):** 38

Pool Depth Max = 30
20

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

☐ > 4.0 meters (> 13') **[30 pts]**
☒ > 3.0 m - 4.0 m (> 9' 7"- 13') **[25 pts]**
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") **[20 pts]**
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
☐ ≤ 1.0 m (≤ 3' 3") **[5 pts]**

COMMENTS 10' 2.5" / 11' 5.25" / 11' 5.5" / 10' 8.25" → Avg = 131.375" = 3.34
122.5" / 137.25" / 137.5" / 128.25" **AVERAGE BANKFULL WIDTH (meters)** 3.34

Bankfull Width Max=30
25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ★NOTE: River Left (L) and Right (R) as looking downstream★

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS ———

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☒ Stream Flowing
☐ Subsurface flow with isolated pools (interstitial)
☐ Moist Channel, isolated pools, no flow (intermittent)
☐ Dry channel, no water (ephemeral)

COMMENTS ———

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐ None ☐ 0.5 ☐ 1.0 ☐ 1.5 ☒ 2.0 ☐ 2.5 ☐ 3.0 ☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Mad River Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Greene Township/City: Beaver Creek / Beaver Creek

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 1/27/24 Quantity: 0.6 in

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 50

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): —

Field Measures: Temp (°C) — Dissolved Oxygen (mg/l) — pH (S.U.) — Conductivity (umhos/cm) —

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: excessive lateral erosion, incised

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) Y Species observed (if known): creek chubs

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

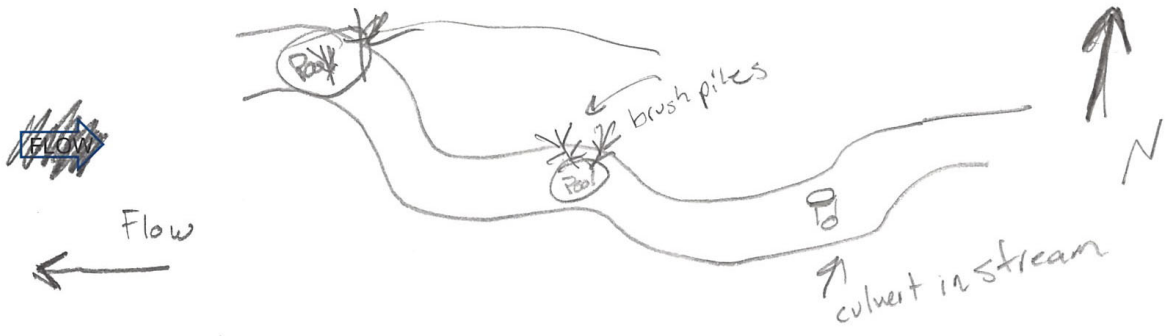
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) Y Species observed (if known): water striders

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



U.S. Department of Agriculture Consultation

USDA Response – 10 Jul 24

From: Martin, Jessica - FPAC-NRCS, OH <Jessica.Martin1@usda.gov>
Sent: Wednesday, July 10, 2024 9:15 AM
To: BAKER, RAYMOND F CIV USAF AFMC 88 CEG/CEIE <raymond.baker.2@us.af.mil>
Cc: BRADY, MICHAEL A CIV USAF AFMC 88 CEG/CEIEA <michael.brady.22@us.af.mil>; PERSHING, MELANIE A CIV USAF AFMC 88 CEG/CEIEA <melanie.pershing@us.af.mil>
Subject: [Non-DoD Source] RE: Farmland Protection Policy Act Question _ Greene County

Good morning,

Thank you for returning the completed form to us. I reviewed the form and parts VI and VII were completed. From the completed form the total score was 97. Lands that receive a combined score of less than 160 points are not subject to the provisions of FPPA.

Thank you,
Jessica Martin

Miami Conservancy District Consultation

MCD Response – 5 Dec 23

MCD
MIAMI CONSERVANCY DISTRICT

38 E. Monument Ave.
Dayton, OH 45402
(937) 223-1271

December 5, 2023

Mr. Darryn Warner
88 ABW/CEIEA
1450 Littrell Road, Building 22
Wright-Patterson AFB, OH 45433-5209

Re: Huffman Retarding Basin, WPAFB, EA for Enhanced Use Lease

Dear Mr. Warner:

We have reviewed the Environmental Assessment (EA) to evaluate impacts associated with an Enhanced Use Lease agreement for future development of two parcels of WPAFB property.

As the proposed project is located outside of the Huffman Storage Basin, it is not subject to Miami Conservancy District (MCD) restrictions.

Based on our review it appears the proposed actions would not adversely affect the retarding basin.

Thank you for the opportunity to review and provide comments. If you have any further questions please contact me at (937) 223-1278, ext. 3230 or by email at rfarrier@mcdwater.org.

Sincerely,

Roxanne H. Farrier
Property Administrator

cc: Don O' Connor

U.S. Army Corps of Engineers Consultation

USACE Response – 26 Apr 24

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U.S. Army Corps of Engineers (USACE)

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)

For use of this form, see Sec 404 CWA, Sec 10 RHA, Sec 103 MPRSA; the proponent agency is CECW-COR.

Form Approved -
OMB No. 0710-0024
Expires 2024-04-30

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.

Principal Purpose The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the review area that may be subject to federal jurisdiction under the regulatory authorities referenced above.

Routine Uses This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice or FOIA request as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in any resulting jurisdictional determination (JD), which may be made available to the public on the District's website and/or on the Headquarters USACE website.

Disclosure Submission of requested information is voluntary; however, if information is not provided, the request for a JD cannot be evaluated nor can a PJD be issued.

The Agency Disclosure Notice (ADN)

The public reporting burden for this collection of information, 0710-0024, is estimated to average 25 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

SECTION I - BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 2024-04-26

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:
Darryn Warner
1450 Littrell Rd. WPAFB, OH 45433

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
Huntington District, Gerlaugh Site, LRH-2024-175-GMR

D. PROJECT LOCATION AND BACKGROUND INFORMATION:
(*USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES*)

State: Ohio | County/Parish/Borough: Greene | City: WPAFB

Center coordinates of site (*lat/long in degree decimal format*): Latitude: 39.77038 ° | Longitude: -84.09380 °

Universal Transverse Mercator: 16

Name of nearest waterbody: Mad River

E. REVIEW PERFORMED FOR SITE EVALUATION (*CHECK ALL THAT APPLY*):

☒ Office (*Desk*) Determination. Date: 2024-04-26

☐ Field Determination

Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

+	Site Number	Latitude (*decimal degrees*)	Longitude (*decimal degrees*)	Estimated amount of aquatic resource in review area (*acreage and linear feet, if applicable*)	Type of aquatic resource (*i.e., wetland vs. non-wetland waters*)	Geographic authority to which the aquatic resource "may be" subject (*i.e., Section 404 or Section 10/404*)
X	SB6	39.77038	-84.09380	200ft	non-wetland perennial stream	Section 404

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1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD or no JD whatsoever, which do not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the USACE has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD or reliance on no JD whatsoever; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of USACE permit authorization based on a PJD or no JD whatsoever constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the USACE will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

F. SUPPORTING DATA. Data reviewed for PJD (*check all that apply)*

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:

Map: Applicant provided JD request form dated 22 February 2024, "Report of Wetland Assessment and Stream Headwater Habitat Evaluation for the Gerlaugh Parcel,Wright Patterson Air Force Base", dated 14 February 2024, prepared by USFWS and additional information received 27 February 2024.

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report.

Rationale:

☐ Data sheets prepared by the USACE:

☐ Corps navigable waters' study:

☐ U.S. Geological Survey Hydrologic Atlas:

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name:

ORM generated on 26 April 2024; Fairborn USGS 1:24K Quad Name

☒ USDA Natural Resources Conservation Service Soil Survey.

Citation: ORM generated on 26 April 2024

☒ National Wetlands Inventory map(s).

Cite Name: ORM generated on 26 April 2024

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☐ State/Local Wetland Inventory map(s):

☐ FEMA/FIRM maps:

☐ 100-year Floodplain Elevation is: _____. (National Geodectic Vertical Datum of 1929)

☐ Photographs: ☐ Aerial (*Name & Date*): _____

or ☐ Other (*Name & Date*): _____

☐ Previous determination(s). File no. and date of response letter:

☒ Other information (*please specify*):

Conceptual development plan attached as part of supporting documentation package.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the USACE and should not be relied upon for later jurisdictional determinations.

Name of Regulatory Staff Member Completing PJD	Date	Signature of Regulatory Staff Member Completing PJD
Laurie A Moore	2024-04-26	Laurie A Moore
Name of Person Requesting PJD	**Date**	**Signatureof Person Requesting PJD *(REQUIRED, unless obtaining the Signature is Impracticable***
Darryn M. Warner	27Feb2024	WARNER.DARRYN.M.1386410808 Digitally signed by WARNER.DARRYN.M.1386410808 Date: 2024.02.27 19:43:47 -05'00'

[1] Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

REPLY TO
ATTENTION OF

April 26, 2024

Regulatory Division
North Branch
LRH-2024-00175-GMR-Lily Creek

PRELIMINARY JURISDICTIONAL DETERMINATION AND PRE-APPLICATION INFORMATION

Darryn Warner
1450 Littrell Road
WPAFB, OH 45433

Dear Darryn Warner:

I refer to your request for a preliminary jurisdictional determination (JD) for the potentially jurisdictional aquatic resources on the approximately 23-acre Gerlaugh Parcel Area B site located south of Colonel Glenn Highway, Wright Patterson Air Force Base (WPAFB), Greene County, Ohio (39.77038 ° N, -84.09380° W). On-site waters flow indirectly to the Mad River, which is a tributary to the Great Miami River, a traditional navigable water of the United States. Your JD request has been assigned the following file number: LRH-2024-00175-GMR-Lily Creek. Please reference this number on all future correspondence related to this JD request.

The United States Army Corps of Engineers' (Corps) authority to regulate waters of the United States is based on the definitions and limits of jurisdiction contained in 33 CFR Part 328 and 33 CFR Part 329. Section 404 of the Clean Water Act (Section 404) requires a Department of the Army (DA) permit be obtained prior to discharging dredged and/or fill material into waters of the United States, including wetlands. Section 10 of the Rivers and Harbors Act of 1899 (Section 10) requires a DA permit be obtained for any work in, on, over or under a navigable water.

Preliminary Jurisdictional Determination

Based upon a review of the information provided and other information available to us, this office has determined one (1) perennial stream (SB6, 200 linear feet) is located within the preliminary JD review area on the 23-acre site. The aquatic resources identified above and on the enclosed preliminary JD form may be waters of the United States in accordance with the Regulatory Guidance Letter for JDs issued by the Corps on October 31, 2016 (Regulatory Guidance Letter No. 16-01). As indicated in the guidance, this preliminary JD is non-binding and cannot be appealed (33 CFR § 331.2), and only provides a written indication that waters of the United States, including wetlands, may be present on-site.

You have declined to exercise the option to obtain an approved JD in this instance and at this time for the above aquatic resources. However, for the purposes of the determination of impacts, compensatory mitigation, and other resource protection measures for activities that require authorization from this office, the above aquatic resource will be evaluated as if they are waters of the United States.

Enclosed please find a copy of the preliminary JD form. If you agree with the findings of this preliminary JD and understand your options regarding the same, please sign and date the preliminary JD form and return it to this office within 30 days of receipt of this letter. You should submit the signed copy to Laurie Moore of the North Branch at laurie.a.moore@usace.army.mil or to the following address:

United States Army Corps of Engineers
Huntington District
Attn: North Branch
502 Eighth Street
Huntington, West Virginia 25701

This determination has been conducted to identify the limits of the Corps' Section 404 jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are United States Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

Pre-Application Information

The United States Army Corps of Engineers' (Corps) authority to regulate waters of the United States is based on the definitions and limits of jurisdiction contained in 33 CFR Part 328 and 33 CFR Part 329. Section 404 of the Clean Water Act (Section 404) requires a Department of the Army (DA) permit be obtained prior to discharging dredged and/or fill material into waters of the United States, including wetlands. Section 10 of the Rivers and Harbors Act of 1899 (Section 10) requires a DA permit be obtained for any work in, on, over or under a navigable water.

Activities subject to regulation under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899 may be authorized by a General Permit or an Individual Permit (IP). General Permits are issued nationwide or regionally for a category or categories of activities that are either similar in nature and cause only minimal individual and cumulative adverse impacts (Nationwide and Regional General Permits). There are currently 57 Nationwide Permits (NWPs) with 32 general conditions used by the Corps to authorize projects resulting in minimal individual and cumulative adverse impacts. There are 41 NWPs that are valid until March 14, 2026 and can be found at:
http://www.lrh.usace.army.mil/Missions/Regulatory/Public-Notices/Article/2944608/lrh-2022-00006-oh/

There are also 16 NWPs that are also valid until March 14, 2026 and can be found at: https://www.lrh.usace.army.mil/Missions/Regulatory/Public-Notices/Article/2527006/nationwide-permits-for-the-state-of-ohio/

For instance, NWP 39, *Commercial and Institutional Developments*, authorizes the discharges of dredged or fill material into non-tidal waters of the United States or work in navigable waters for the construction or expansion of commercial and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States and meets the terms and conditions of this NWP.

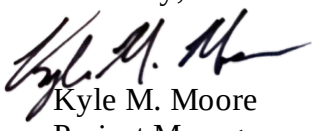
Under the NWPs, pre-construction notification (PCN) to the Corps for authorization is required in many cases and resource agency coordination (Ohio Environmental Protection Agency, United States Fish and Wildlife Service, and Ohio State Historic Preservation Office) is required in some cases. Additionally, if threatened or endangered species or it's critical habitat might be affected by the activity or is in the vicinity of the project; or if the activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing in, or potentially eligible for listing in the National Register of Historic Places, including previously unidentified properties, the applicant may not begin the activity until notified by the Corps that the requirements of the Endangered Species Act and/or the National Historic Preservation Act have been satisfied and that the activity is authorized. Further, if the proposed activity requires a written waiver to exceed specified limits of certain NWPs the applicant cannot begin the activity until the Corps approves a waiver (case-by-case basis). NWP General Condition 32(b) and (c) and Regional Condition 6 outline the information that must be included in a PCN.

Activities that do not qualify for authorization under the General Permit program may qualify for authorization by a Standard IP. Authorization under an IP may be obtained only through application (ENG Form 4345) with the Corps. These permits are issued for activities that have more than minimal adverse impacts to waters of the United States and evaluation of each permit application involves more thorough review of the potential environmental effects of the proposed activity upon the public interest. The Corps may not issue a permit if the proposed project is not in the public interest, is not in compliance with the United States Environmental Protection Agency's Section 404(b)(1) guidelines (this does not apply to Section 10 of the Rivers and Harbors Act of 1899 only activities), is not in compliance with other laws (such as Section 401 of the Clean Water Act, National Environmental Policy Act, Fish and Wildlife Coordination Act, Endangered Species Act, National Historic Preservation Act), would result in significant degradation of the aquatic environment (net after mitigation), or if the proposed mitigation is not determined to be adequate.

If the proposed project would not result in a discharge of dredged and/or fill material into waters of the United States subject to regulation under Section 404 or involve work in, on, over, or under a navigable water subject to regulation under Section 10, authorization from our office would not be required. However, if the proposed project would result in a discharge of dredged and/or fill material into waters of the United States subject to regulation under Section 404 or involve work in, on, over, or under a navigable water subject to regulation under Section 10, a DA permit from our office would be required.

Enclosed, you will find helpful information. We appreciate your concern for our nation's aquatic resources. We are available for pre-application consultation. If you have any questions concerning the above, please contact Laurie Moore of the North Branch at (937) 271-9942, by mail at the above address, or by email at laurie.a.moore@usace.army.mil.

Sincerely,



Kyle M. Moore
Project Manager
North Branch

Enclosures


Wright-Patterson
Air Force Base
Montgomery
Greene
Beavercreek
1:8,379
0 0.05 0.1 0.2 mi
0 0.1 0.2 0.4 km


WRIGHT-PATTERSON
AIR FORCE BASE
(Closed)
LRH-2013-00489-GMR
Wayside Chapel
New Germany
Trailer Park
Page Manor
Page Manor Schools
HENDON AVE
ENRIGHT AVE
BARRETT
BAYSIDE
TRAVIS
WILLASTON
GARDENVIEW
DRIVE
RUSHTON DR
GRAHAM DR
ORM Project Locations
ORM Project Points
ORM Project Areas
ORM Project Lines

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HUNTINGTON DISTRICT
502 8TH STREET
HUNTINGTON, WV 25701-2018

Enclosure 1 – Jurisdictional Determination Requests

DISCLAIMER: The below information is intended to provide helpful contact information and other submittal recommendations as of 29 March 2024. Contact the appropriate local, state, or federal agency for the most updated links.

• **Preliminary Jurisdictional Determination (PJD)**: A PJD is defined in Corps regulations at 33 CFR § 331.2. As explained in further detail in Regulatory Guidance Letter No. 16-01, a PJD is used to indicate that this office has identified the approximate location(s) and boundaries of wetlands and/or other aquatic resources on a site that are presumed to be subject to regulatory jurisdiction of the Corps. Unlike an approved jurisdictional determination (AJD), a PJD does not represent a definitive, official determination that there are, or that there are not, jurisdictional aquatic resources on a site, and does not have an expiration date.

• **Approved Jurisdictional Determination (AJD)**: An AJD is defined in Corps regulations at 33 CFR § 331.2. As explained in further detail in Regulatory Guidance Letter No. 16-01, an AJD is used to indicate that this office has identified the presence or absence of wetlands and/or other aquatic resources on a site, including their accurate location(s) and boundaries, as well as their jurisdictional status. AJDs are valid for five (5) years.

Requests for JDs should be submitted to LRH.permits@usace.army.mil using the following ENG Form 6247:

https://www.publications.usace.army.mil/Portals/76/Eng_Form_6247_2023Nov17.pdf

Enclosure 2 – Compensatory Mitigation

Compensatory mitigation is typically accomplished through the following three (3) ways:

1. **Mitigation Banks**: "When permitted impacts are located within the service area of an approved mitigation bank, and the bank has the appropriate number and resource type of credits available, the permittee's compensatory mitigation requirements may be met by securing those credits from the sponsor. An approved instrument (including an approved mitigation plan and appropriate real estate and financial assurances) for a mitigation bank is required to be in place before any credits may be released and made available to compensate for authorized impacts. Use of a mitigation bank can help reduce risk and uncertainty of achieving successful ecological compensation, as well as temporal loss of resource functions and services" (33 CFR 332.3 (b)(2)).

2. **In-Lieu Fee Mitigation**: "Where permitted impacts are located within the service area of an approved in-lieu fee program, and the sponsor has the appropriate number and resource type of credits available, the permittee's compensatory mitigation requirements may be met by securing those credits from the sponsor. Where permitted impacts are not located in the service area of an approved mitigation bank, or the approved mitigation bank does not have the appropriate number and resource type of credits available to offset those impacts, in-lieu fee mitigation (advance credits) may be used if available and is generally preferable to permittee-responsible mitigation" (33 CFR 332.3 (b)(3)).

3. **Permittee-Responsible Mitigation**: "Where permitted impacts are not in the service area of an approved mitigation bank or in-lieu fee program that has the appropriate number and resource type of credits available, permittee-responsible mitigation is the only option" (33 CFR 332.3 (b)(4)). A watershed approach should be part of determining the location of compensatory mitigation that would be developed by the permittee. The location could be at or adjacent the impact site (i.e., on-site mitigation) or at another location, usually within the same watershed as the permitted impact (i.e., off-site mitigation). The permittee retains responsibility for the implementation and success of the mitigation project.

Visit the Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) website at https://ribits.ops.usace.army.mil/ords/f?p=107:2 to determine if your project location is in the service area of a mitigation bank or in-lieu fee site and whether or not there are credits available.

If using a bank or in-lieu fee program, the applicant does not need to provide every compensatory mitigation plan component listed at 33 CFR 332.4(c). However, the applicant must include a description of the baseline conditions at the impact site, the number and type of resource credits to be secured, and how these were determined. There are 13 required components that should be included in detail in every compensatory mitigation plan (33 CFR 332.4(c)). The mitigation proponent must provide

written justification why any one (or more) component(s) is not necessary and ensure that the proposed mitigation plan is both successful and sustainable.

Banks and in-lieu fee programs are usually considered preferable to permittee-responsible mitigation as they involve such aspects as: consolidating compensatory mitigation projects where ecologically appropriate, using a watershed approach, providing a greater level of financial planning and scientific expertise, reducing temporal losses of functions, and reducing uncertainty over project success. If a proposed project is located within the service area of an existing mitigation bank or in-lieu fee program, the permit applicant will normally be required to purchase the necessary mitigation credits.

In the state of Ohio, to identify each aquatic resource type that would be adversely impacted by a proposed project, the permit applicant should use an appropriate classification system, such as the Classification of Wetlands and Deepwater Habitats of the United States, and the Ohio Rapid Assessment Method (ORAM) for wetlands and the Field Guide for Stream Classification (Rosgen) and/or Qualitative Habitat Evaluation Index (QHEI) or Headwater Habitat Evaluation Index (HHEI) for streams. The resource type will be used to help determine if a proposed mitigation plan offsets adverse impacts to a specific resource type or meets the aquatic resource needs of the watershed.

The amount of compensatory mitigation credits required to offset the proposed permanent loss of wetland should be calculated and verified in accordance with the Ohio Revised Code (OAC 3745-1-54 - Wetland Anti-degradation Guidance).

ORAM Category of Wetland Impacted	Wetland Type	Minimum Mitigation Ratio	Wetland Replacement ORAM Category
1	Non-forested	1.5:1	2 or 3
1	Forested	1.5:1	2 or 3
2	Non-forested	2.0:1	2 or 3
2	Forested	2.5:1	2 or 3
3	Non-Forested	2.5:1	3
3	Forested	3.0:1	3

The replacement ratios in the Interagency Review Team Stream Mitigation Guidelines (Checklist) should be used to determine stream mitigation debits.

GROUP	STREAM TYPE	Debit Ratio
1	Ephemeral streams with sand/silt/muck/clay/artificial dominated substrates	1:1
1	Limited Resource Waters	1:1
1	Ephemeral streams with bedrock/boulder/cobble/gravel/sand mixed substrates	1.5:1
1	Intermittent streams with sand/silt/muck/clay/artificial dominated substrates	1.5:1
1	Modified Warmwater and Modified Warmwater Habitat Equivalent	1.5:1
2	Intermittent with bedrock/boulder/cobble/gravel/sand mixed substrates	2:1
2	Warmwater and Warmwater Habitat Equivalent	2:1
3	Headwater Perennial/Interstitial - Cold Water Habitat Equivalent (generally less than 3 square mile drainage area)	3:1
3	Coldwater and Coldwater Habitat Equivalent	3:1
3	Seasonal Salmonid	3:1
3	Special Waters	3:1
3	Exceptional Warmwater	3:1

Enclosure 3 – Helpful Information

DISCLAIMER: The below information is intended to provide helpful contact information and other submittal recommendations. Contact the appropriate local, state, or federal agency for the most updated links.

Shellfish Beds

Shellfish beds in Ohio include concentrations of freshwater mussels. All native mussels are protected in the State of Ohio (Section 1533.324 of the Ohio Revised Code). In addition, 10 federally listed species occur in the state and are protected by the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. § 1531 et seq.). All rivers and tributaries that contain mussels or potential mussel habitat must be surveyed prior to any proposed streambed disturbance. Currently accepted protocol and supporting materials can be found on the Ohio Department of Natural Resources' website:

https://ohiodnr.gov/wps/portal/gov/odnr/buy-and-apply/special-use-permits/collecting-research/ohio-mussel-surveyor

Spawning Areas

Any work associated with a regulated activity in the state of Ohio cannot take place during the restricted period of the following Ohio Department of Natural Resources, Division of Wildlife In-Water Work Restrictions, unless the applicant receives advanced written approval (a copy of which should be submitted with the PCN/application submittal) from the Ohio Department of Natural Resources, Division of Wildlife and receives written approval from the Corps:

a. Salmonid Locations Restriction Period: September 15 – June 30

i. Arcola Creek (entire reach)
ii. Ashtabula Harbor
iii. Ashtabula River (Hadlock Rd. to mouth)
iv. Aurora Branch (Chagrin River (RM 0.38 to mouth))
v. Big Creek (Grand River (Girdled Road to mouth))
vi. Black River (entire reach)
vii. Chagrin River (Chagrin Falls to mouth)
viii. Cold Creek (entire reach)
ix. Conneaut Creek (entire reach)
x. Conneaut Harbor
xi. Corporation Creek (Chagrin River (entire reach))
xii. Cowles Creek (entire reach)
xiii. Ellison Creek (Grand River (entire reach))
xiv. Euclid Creek (entire reach)

xv. Fairport Harbor
xvi. Grand River (Dam at Harpersfield Covered Bridge Park to mouth)
xvii. Gulley Brook (Chagrin River (entire reach))
xviii. Huron River (East Branch-West Branch confluence to mouth)
xix. Indian Creek (entire reach)
xx. Kellogg Creek (Grand River (entire reach))
xxi. Mill Creek (Grand River (entire reach))
xxii. Paine Creek (Grand River (Paine Falls to mouth))
xxiii. Rocky River (East Branch-West Branch confluence to mouth)
xxiv. Smokey Run (Conneaut Creek (entire reach))
xxv. Turkey Creek (entire reach)
xxvi. Vermilion River (dam at Wakeman upstream of the US 20/SR 60 bridge to mouth)
xxvii. Ward Creek (Chagrin River (entire reach))
xxviii. Wheeler Creek (entire reach)
xxix. Whitman Creek (entire reach)

b. Other Locations Restriction Period: March 15 – June 30

i. All other perennial streams not listed above as salmonid.
ii. Also includes Lake Erie and bays not listed above as salmonid.

Note: This list is subject to change as determined by the Ohio Department of Natural Resources, Division of Wildlife.

Water Supply Intakes

Locations of drinking water source protection areas in Ohio associated with public water supply intakes, including the name of the public water supply, can be found at the following link:

https://oepa.maps.arcgis.com/apps/webappviewer/index.html?id=3b39e11ba7fc43c3b41801e3580e6d21

Contact information for public water suppliers can be obtained from Ohio EPA by contacting the Division of Drinking and Ground Waters at whp@epa.ohio.gov or 614-644-2752.

Locations of public water supply intakes in West Virginia can be found at the following link:

http://gis.wvinfrastructure.com/

Fills Within 100-year Floodplains

The following website provides a statewide listing of Floodplain Managers in Ohio: https://ohiodnr.gov/wps/portal/gov/odnr/discover-and-learn/safety-conservation/about-ODNR/water-resources/floodplains/

Wild and Scenic Rivers

Prior to submitting a PCN/DA permit application for work in a National Wild and Scenic River System, it is recommended that the applicant contact the National Park Service Regional Wild and Scenic Rivers Specialist, at the Midwest Regional Office, 601 Riverfront Drive, Omaha, Nebraska 68102. Any determination provided by the National Park Service should be submitted with the PCN. The following website provides information on National Wild and Scenic Rivers within Ohio:

https://www.rivers.gov/ohio.php

Endangered Species

To obtain the most up to date information on federally threatened and endangered species applicants are encouraged to utilize the United States Fish and Wildlife Service's Information for Planning and Consultation System (IPaC) found at https://ecos.fws.gov/ipac/

Prior to the submittal of a PCN/DA permit application in Ohio, applicants may also contact the United States Fish and Wildlife Service, Ohio Ecological Services Field Office at:

Address: 4625 Morse Road, Suite 104
Columbus, Ohio 43230

Email: ohio@fws.gov

Phone: (614) 416-8993

The Ohio Mussel Survey Protocol may be found at the following link:

https://ohiodnr.gov/wps/portal/gov/odnr/buy-and-apply/special-use-permits/collecting-research/ohio-mussel-surveyor

Prior to the submittal of a PCN/DA permit application in West Virginia, applicants may also contact the United States Fish and Wildlife Service, West Virginia Field Office, Ecological Services at:

Address: 6263 Appalachian Highway
Davis, West Virginia 26260

Email: fw5_wvfo@fws.gov

Migratory Bird Breeding Areas and Migratory Birds and Bald and Golden Eagles

For projects in Ohio, information may be obtained from the United States Fish and Wildlife Services, Ohio Ecological Services Field Office at:

Address: 4625 Morse Road, Suite 104
Columbus, Ohio 43230

Email: ohio@fws.gov

Phone: (614) 416-8993

The Ohio Division of Natural Resources Division of Wildlife may be contacted at (800) 945-3543.

Historic Properties

The Ohio National Register of Historic Places can be found at the following link: https://www.ohiohistory.org/preserve/state-historic-preservation-office/nationalregister

When reviewing a PCN/DA permit application, the Corps will scope appropriate historic property identification efforts and, if applicable, work with the applicant to take into account the effect of the proposed activity on historic properties. In these instances, information and coordination may include:

- Requesting comments directly from the Ohio History Connection State Historic Preservation Office on the effect the proposed regulated activity may have on historic properties. The Ohio History Connection, State Historic Preservation Office may be contacted at:

  Address: Ohio History Connection
  800 E. 17th Ave., Columbus, Ohio 43211
  Phone: (614) 297-2300
  Email: info@ohiohistory.org

- To identify potential historic properties that may be affected by a proposed project, the following information may be reviewed and/or provided with the PCN/DA permit application when applicable:
  - A detailed description of the project site in its current condition (i.e. prior to construction activities) including information on the terrain and topography of the site, the acreage of the site, the proximity of the site to major waterways, and any known disturbances within the site.
  - A detailed description of past land uses in the project site.

- Photographs and mapping showing the site conditions and all buildings or structures within the project site and on adjacent parcels are useful. Photographs and maps supporting past land uses should be provided as available.
- Information regarding any past cultural resource studies or coordination pertinent to the project area, if available.
- United States Geological Survey (USGS) 7.5' series topographic maps;
- Ohio History Connection State Historic Preservation Office files including:
  - Ohio Archaeological Inventory files;
  - Ohio Historic Inventory files;
  - Ohio State Historic Preservation Office Cultural Resources Management /contract archaeology files;
  - National Register of Historic Places files including Historic Districts; and
  - County atlases, histories and historic USGS 15' series topographic map(s).

Water Quality

The Ohio Environmental Protection Agency may be contacted at:

Address: Lazarus Government Center
50 W Town St. Suite 700
Columbus, Ohio 43215

Phone: (614) 644-2001

Information pertaining to the Ohio Environmental Protection Agency water quality certification (WQC) program, including the Section 401 Clean Water Act WQC application form, can be obtained at the following link: https://epa.ohio.gov/divisions-and-offices/surface-water/permitting/water-quality-certification-and-isolated-wetland-permits

Enclosure 4 – Pre-Application Consultation

1) A complete written description of the project and all proposed activities (Delineation/ Estimation of waters of the United States within the proposed project area, conceptual site plans for the overall project and approximate impacts to waters of the United States, and coordinates for the site(s)).

2) A written meeting agenda with goals and objectives.

3) One copy of a United States Geological Survey quadrangle map with the site clearly outlined to scale.

4) One color copy of an aerial photograph of the site.

5) One copy of the appropriate United States Soil Conservation Service map(s) with the site clearly outlined to scale.

6) One set of color photographs depicting the entire project area, mounted on 8.5” x 11” paper and accompanied by a map showing the location and direction from which each photograph was taken.

7) If applicable, the potential applicant shall also include a copy of any floodplain mapping such as a FEMA flood insurance map with the site clearly outlined to scale.

Requests for pre-application consultation should be submitted to LRH.permits@usace.army.mil

Enclosure 5 – Application Submittal

- PCNs/DA permit applications should be saved as a PDF document, and then submitted as an attachment LRH.permits@usace.army.mil

- Electronic documents must have sufficient resolution to show project details. If you find that your submittal is too large to send electronically, you may send multiple emails or use of the Department of Defense Secure Access File Exchange (DoD SAFE) service to transfer large files may be requested in your email.

- For tracking and processing purposes, the email should include the following:

    - **Email Subject Line:** include the name of the applicant, type of PCN request, and location (County and State). Example: RE: Doe, John, PCN and Section 401 WQC Request, Summit County, Ohio;
    - **Email Body:** 1) Brief description of the proposed project, 2) contact information (phone number, mailing address, and email address) for the applicant and/or their agent, and 3) the project location: Address and Latitude/Longitude in decimal degrees (e.g. 42.92788° N, 88.36257° W).

- If you do not have internet access, information may be submitted through the United States Postal Service to:

    United States Army Corps of Engineers, Huntington District
    ATTN: Regulatory Division
    502 Eighth Street
    Huntington, West Virginia 25701-2070

Waters of the United States (WOTUS) Delineation Report Checklist
Huntington District
State of Ohio

11 March 2024 (update)

The United States Army Corps of Engineers' (Corps), acting under Section 404 of the Clean Water Act (Section 404) and Section 10 of the Rivers and Harbors Act of 1899 (Section 10) regulates certain activities occurring in waters of the United States. Under Section 404 a Department of the Army (DA) permit must be obtained prior to discharging dredged or fill material into waters of the United States, including adjacent and abutting wetlands. Under Section 10, a DA permit must be obtained for any work in, on, over or under a navigable water of the United States. The Corps' authority to regulate waters of the United States is based on the definitions and limits of jurisdiction contained in 33 Code of Federal Regulations 328 and 329. The limit of Corps jurisdiction for non-tidal waters of the United States in the absence of adjacent wetlands is the ordinary high-water mark.

The ordinary high-water mark is defined as that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high-water mark to the limits of the adjacent wetlands.

Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, etc. are considered adjacent wetlands. Abutting wetlands are not separated from the tributary by an upland feature, such as a berm or dike.

To determine whether DA authorization is required under Section 404 and/or Section 10, it is necessary for applicants to submit a request for jurisdictional determination along with a WOTUS delineation report of the location and boundaries of all potential waters of the United States, including all water features (interstate waters, intrastate lakes, rivers, streams [perennial, intermittent and ephemeral], ponds, wetlands, impoundments of waters and tributaries to these waters as well as adjacent wetlands, and navigable waters of the United States), within the project area.

It is recommended that the delineation be prepared by an environmental consultant familiar with the use of the Corps' 1987 Wetland Delineation Manual and its supplements. The manual identified different methods for conducting delineations;

therefore, the method used and rationale for choosing the specific method should be indicated. The Corps has supplemented the 1987 Wetland Delineation Manual with new data forms and indicators that must be used for any data collection for wetland delineations within the Eastern Mountain and Piedmont Land Reserve, Midwest and Northcentral and Northeast Regions of Ohio as shown on the map. Wetland delineations must be prepared in accordance with the current method required by the Corps at: https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/.

At a minimum, the following information should be included in the delineation report to increase the efficiency of our review process:

1. Name, address and phone number of the current property owner(s), requestor (if different), and agent, if applicable, and a statement granting the Corps permission to access the property; If site access is granted, please indicate whether the landowner would like advance notice of a site visit;

2. A narrative addressing the size of the project site in acres.

3. Directions to the site from the nearest interstate highway.

4. Site location map (8 ½ by 11-inch copies of 7.5-minute United States Geological Survey (USGS) quadrangle maps, national wetland inventory maps, published soil survey maps, scaled aerial photographs, and/or other suitable maps) and center coordinates (provided in latitude and longitude [degree decimal format]) of the site; mapping of information should be clearly marked and shown in relation to the nearest roads, water features, cities and towns; mapping should also include the dates of delineation and mapping, a legend identifying any symbols, shading or patterns, appropriate scale, and boundaries of review area;

5. Map (preferably a 7.5-minute USGS quadrangle map) of the delineation review area – this map should define the boundaries of all aquatic resources present on the property (wetlands, lakes, streams, ponds, ditches, etc.) and provide an estimated size of each aquatic resource (provided in acres for wetlands, lakes and ponds and linear feet and width for streams and rivers); coordinates for each wetland and/or waterway should also be provided; it is preferable to distinguish between wetlands and other water features such as streams and ponds;

6. Name of nearest waterbody/drainage pattern information – characterization of site hydrology by addressing direction (how water flows through or drains from the site), source (surface or subsurface, including potential irrigation influence), frequency and duration of on-site drainage, directional features such as gradients and identifying any named waterways on or in the vicinity of the site; discussion of the surface tributary system for each potential water (noting the surface tributary connection to other waters of the United States), discussion of the hydrologic flow back to the Section 10 navigable water and other pertinent

information on hydrology; all unnamed tributaries should be identified as unnamed tributary to the receiving waters (e.g. unnamed tributary to Big Walnut Creek);

7. A functional assessment (i.e., Ohio Rapid Assessment Method [ORAM] and Qualitative Habitat Evaluation Index [QHEI]) or Headwater Habitat Evaluation Index, as appropriate, should be provided for each aquatic resource type within the review area;

    a. Ohio Environmental Protection Agency (OEPA) has published the ORAM, which can be used to evaluate wetland quality based on functions and values of a wetland. ORAM (version 5.0) Quantitative Rating Forms should be completed during the wetland delineation and submitted with the report. These are found at:

    ORAM information: https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/wetland-ecology

    ORAM form: https://epa.ohio.gov/static/Portals/35/401/ORAMv5_score_forms_10_page.pdf

    ORAM manual: https://epa.ohio.gov/static/Portals/35/401/ORAM%20Manual%205.0.pdf

    b. The OEPA developed the QHEI and HHEI as numeric habitat evaluation index that is used to define structural and functional characteristics capable of supporting aquatic life. The QHEI and HHEI are used as gauges in measuring the physical quality of stream habitat and can be used to determine the applicable use designation for a stream. QHEI forms can be found at HHEI forms can be found at:

    Biocriteria Manuals and QHEI information: https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/biological-criteria-for-the-protection-of-aquatic-life

    QHEI Manual: https://epa.ohio.gov/static/Portals/35/documents/QHEIManualJune2006.pdf

    Primary Headwater information: https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/primary-headwater-streams-in-ohio

    Primary Headwater Manual (includes HHEI): https://epa.ohio.gov/static/Portals/35/wqs/headwaters/PHWHManual_2020_Ver_4_1_May_2020_Final.pdf?ver=Jx6Z3rn9feBAUir3HWp_FQ%3d%3d

8. Information on existing site conditions, including past and present land uses, site modifications, recent disturbances, topography, etc.

9. A description of riparian and other buffer features around water features in the review area.

10. Rate of average annual flow in cubic feet per second for streams, ditches, lakes and swales (where applicable);

11. Acreage of watershed areas (i.e. 8-digit Hydrologic Unit Code);

12. Acreage of drainage area that is immediately up gradient of the subject wetland/waterway.

13. a description and mapping of those aquatic features that exhibit wetland characteristics and are potentially isolated and/or lack an interstate or foreign commerce connection, including any information that may support the Corps' determination of jurisdiction over such areas.

14. The following should be provided for each delineated stream and ditch:

    a. channel information (with respect to the top of the bank) on the width, depth and sideslopes of each waterway within the review area.

    b. indicate if the channel has defined bed and banks and if any ordinary high-water mark can be determined.

    c. indicate the primary substrate of the channel (cobble, silt, rock sand, bedrock, concrete, muck, etc.) and, if vegetated, provide percent cover of vegetation by type.

    d. describe whether the waterway is natural, artificial (man-made) or manipulated (e.g., straightened, channelized, culverted, etc.);

    e. describe whether the flow is perennial, intermittent or ephemeral; indicate the average number of flow events per year and duration; indicate if subsurface flow is present and if surface flow is confined, discrete, a combination of both, or overland sheet flow;

        i. Ephemeral streams have flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

ii. Intermittent streams have flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow; and
iii. Perennial Streams have flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

f. depiction of ephemeral/intermittent and intermittent/perennial transition points and the methods used to be such calls.

g. photographs taken from representative vantage points of all waterways.

h. indicate any other information that may be known such as stream order, 303(d) impaired waters listing, known endangered/threatened species habitat.

15. The following should be provided for each wetland area:

a. a characterization of site hydrology.

b. a characterization of vegetative communities and dominant species (listed by *Genus* and *species*) occurring within each community type.

c. a characterization of the soil types present.

d. a comparison of soils, vegetative and hydrologic conditions between wetland and upland areas.

e. photographs taken at the location of any wetland sample location, with locations of data sheets and directional location of ground photographs shown.

f. wetland determination data forms (including ones completed for upland areas) completed and accurately mapped for each feature, wetland and/or vegetation type present within the review area; depending on the size, shape and overall complexity of site conditions, additional data forms may be required;

g. indication of wetland type according to vegetation type (i.e., emergent, scrub-shrub and forested); and

h. national wetland inventory maps and current and historic land uses (i.e., agricultural, industrial, residential, cropland, lawn, forested, etc.).

Upon receipt of the delineation report and request for jurisdictional determination, the Corps will either verify the conclusions provided the report or request changes to the report based on our office or field review. Once the Corps agrees with the conclusions presented in the report, the Corps will typically send verification of the report in writing. Corps verification of jurisdictional delineation reports is valid for a period of up to five years unless site conditions warrant revisions. We rely on section 10 of the Rivers and Harbors Act of 1899 (RHA), the Clean Water Act (CWA) implementing regulations published by the Department of the Army in 1986 and amended in 1993 (references 2.a. and 2.b. respectively), the 2008 Rapanos-Carabell guidance (reference 2.c.), and other applicable guidance, relevant case law and longstanding practice, (collectively the pre-2015 regulatory regime), and the Sackett decision (reference 2.d.) in evaluating jurisdiction and are followed in the final verification of Clean Water Act jurisdiction.

Applicants may also request a preliminary jurisdictional determination of the review area. As indicated in the Corps Regulatory Guidance Letter for JDs issued by the Corps on October 31, 2016 (Regulatory Guidance Letter No. 16-01 found at: at https://usace.contentdm.oclc.org/digital/collection/p16021coll9/id/1262), preliminary jurisdictional determination are non-binding and cannot be appealed (33 C.F.R. 331.2) and only provide a written indication that waters of the U.S, including wetlands, may be present on-site. For purposes of computation of impacts, compensatory mitigation requirements and other resource protection measures, a permit decision made on the basis of a preliminary jurisdictional determination will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the United States. Please indicate whether you desire to exercise this option or obtain an approved jurisdictional determination. Please be aware if potential isolated waters exist on the site, an approved jurisdictional determination must be completed.

Ohio Environmental Protection Agency Consultation

OEPA Response – 15 Feb 24

February 15, 2024

Mr. John Crocker, RPM
AFCEC/CZOM
Building 20012, Area B
1981 Monahan Way
WPAFB, OH 45433-7205

Re: Wright-Patterson AFB, Fairborn
Remediation Response
Project Records
Federal Facilities
Greene County
529000856001

Subject: Concurrence - Enhanced Use Lease (EUL) project at Earth-Fill Disposal Zone 5 in Area B of Wright-Patterson AFB (WPAFB)

Dear Mr. Crocker:

On January 12, 2024, Wright-Patterson Air Force Base (WPAFB) met with Ohio EPA to visit the Earthfill Disposal Zone 5 (EFDZ-5) property and discuss WPAFB's proposed plans for changing land use from recreational to allow for commercial/industrial development along with changes to any engineering controls (e.g. fence). A meeting was held on January 17th which included U.S. EPA, also a decision maker for the proposal, to discuss the path forward to approve the land use change.

On February 1, 2024, U.S. EPA and Ohio EPA held a joint call with WPAFB and provided guidance for the path forward for moving EFDZ-5 from a recreational land use to a commercial/industrial land use by way of WPAFB's Land Use Control as implemented by the Land Use Control Implementation Plan (LUCIP. Because the LUCIP is undergoing its five-year review, it was decided the upcoming 2024 revised version of the LUCIP will capture the change in land use. In the interim, WPAFB requested a concurrence/approval letter from both Ohio EPA and U.S. EPA documenting the agreed upon path forward is acceptable.

On February 13, 2024, Ohio EPA received the letter[1] from WPAFB providing details for the EUL project at EFDZ-5 and documenting the request to use the LUCIP as the appropriate document in which to change the land use. The letter also included additional items to be implemented during the EUL construction and development.

[1] https://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2737521

Ohio EPA has reviewed the February 13, 2024 letter and gives concurrence on the request for land use change using the LUCIP along with additional items listed for implementation.

If there are any questions, please contact me at (937) 285-6453.

Sincerely,

W. Dwayne Tolson

W. Dwayne Tolson
Site Coordinator / Geologist
Division of Environmental Response and Revitalization

ec: Syed Quadri, U.S. EPA
Bonnie Buthker, Chief

WDT/cf

U.S. Environmental Protection Agency Consultation

USEPA Response – 29 Feb 24

USEPA Response – 26 Apr 24

REGION 5
CHICAGO, IL 60604

February 29, 2024

VIA ELECTRONIC MAIL

John Crocker
Remedial Project Manager
AFCEC/CZOM
1981 Monahan Way
Bldg. 20012, Rm. 116.21
Wright-Patterson AFB, Ohio 45433

Subject: Concurrence to the Earth Fill Disposal Zone 5 Project in Area B of Wright-Patterson AFB (WPAFB)

Dear Mr. Crocker:

Thank you for your letter dated February 13, 2024, outlining the details of the Enhanced Use Lease (EUL) project in Area B of Wright Patterson Air Force Base (WPAFB). As indicated in your letter this project will establish a long-term lease of approximately 20-acres of Earth Fill Disposal Zone 5 (EFDZ5) parcel of undeveloped land located at the eastern boundary of Area B adjacent to National Road for redevelopment. This redevelopment is expected to construct multiple buildings for commercial/industrial land use. Per the terms of the August 1998 Record of Decision (ROD) for 41 No Action Sites at WPAFB, EFDZ5 land parcel was determined to be suitable for unrestricted land use. This ROD identified the selected alternative of no further action for soil at 41 Installation Restoration Program (IRP) Sites based on the final determination of no unacceptable risk to the human health and the environment.

On February 1, 2024, the U.S. Environmental Protection Agency and Ohio EPA held a joint call with WPAFB and provided guidance for updating EFDZ5 land parcel use from recreational land use to commercial/industrial land use in the WPAFB Land Use Control Implementation Plan (LUCIP). The February 13, 2024, letter correctly identifies the necessary steps to be implemented by WPAFB to move forward with this project. The following steps will be needed to complete the EFDZ5 land use update and ensure continued protection of human health and the environment: 1) document the land use change in the WPAFB LUCIP from recreational to commercial/industrial use; 2) install preemptive vapor intrusion mitigation measures for new building construction or collect additional sampling data to demonstrate there is not a complete vapor intrusion

exposure pathway that presents an unacceptable risk; and 3) include per- and polyfluoroalkyl substance (PFAS) sampling for any off-site soil disposal or reuse.

This letter provides concurrence to the steps to move forward with the redevelopment of EFDZ5 land in Area B.

If you have any questions, please contact me 312-886-5736,

Sincerely,

Syed M. Quadri, PMP
Remedial Project Manager

cc: Christopher Brewer, TechLaw (electronic)

REGION 5
CHICAGO, IL 60604

April 26, 2024

VIA ELECTRONIC MAIL

John Crocker
Remedial Project Manager
AFCEC/CZOM
1981 Monahan Way
Bldg. 20012, Rm. 116.21
Wright-Patterson AFB, Ohio 45433

Dear Mr. Crocker:

Subject: EPA's Response to the Earth Fill Disposal Zone 5 Project in Area B of Wright-Patterson AFB (WPAFB)

Thank you for your letter dated March 29, 2024, outlining historical analytical data associated with the Enhanced Use Lease (EUL) project in Area B of Wright Patterson Air Force Base (WPAFB). As indicated in your February 13, 2024 letter, this project will establish a long-term lease of approximately 20-acres at the Earth Fill Disposal Zone 5 (EFDZ5) parcel of land located at the eastern boundary of Area B adjacent to National Road for redevelopment. This redevelopment is expected to construct multiple buildings categorized as commercial/industrial only, not residential. EFDZ5 land parcel was included under the Record of Decision (ROD) for 41 No Action Sites at WPAFB, dated August 1998. This ROD identified the selected alternative of no further action for soil at 41 Installation Restoration Program (IRP) Sites based on the final determination of no unacceptable risk to the human health and the environment.

As discussed in your March 29, 2024 letter, based on historic analytical results, the Air Force has concluded that additional sampling prior to site development does not appear to be warranted at this time. While the U.S. Environmental Protection Agency (EPA) understands that historical VI samples were collected from soil gas and ambient air locations within this area, no additional media (i.e., sub-slab) samples were collected. The EPA remains concerned there is a potential complete exposure pathway from media (i.e., indoor air, crawlspace air, and/or sub-slab) that could present an unacceptable risk to human health. Therefore, the EPA recommends that preemptive vapor intrusion (VI) mitigation measures (i.e., passive or active sub-slab depressurization systems) are installed for new building construction.

To move forward with the redevelopment of EFDZ5 land in Area B, please document the change in the Land Use Control Implementation Plan from recreational to industrial/commercial development; install preemptive vapor

intrusion mitigation measures for new building construction; and include per- and polyfluoroalkyl substance sampling for off-site soil disposal for soils removed from the EFDZ5 parcel.

If you have any questions, please contact me 312-886-5736.

Sincerely,

Syed M. Quadri, PMP
Remedial Project Manager

cc: Christopher Brewer, TechLaw (electronic)

Greene County Traffic Studies Approvals

Hilltop EUL Site – 28 Aug 24

Gerlaugh Farm EUL Site – 5 Sep 24

MEMORANDUMD

To: Stephanie Goff, P.E., P.S., Greene County Engineer
From: Lindsey Kieres, P.E., PTOE
Cc: Paul Goodhue, P.E., PTOE
Date: August 28, 2024
Subject: Proposed WPAFB Hilltop Traffic Impact Study Review Recommendation

Goodhue Consulting, on behalf of the Greene County Engineer, has reviewed the revised proposed WPAFB Hilltop Development Traffic Impact Study, dated August 21, 2024. The submittal followed a Traffic Impact Study, dated August 12, 2024 and June 16, 2024, Volume Submittal, dated April 5, 2024, and the Memorandum of Understanding dated March 6, 2024, approved with comments on March 22, 2024.

After review of this revised Traffic Impact Study dated August 21, 2024, it appears that TEC Engineering has addressed all our previous comments. The following are conditions that are recommended to be required by the development along with the Recommendations listed on page 27 of the report and attached to this recommendation memo:

1. The northern access point whether it is the signalized access point or the right-in/right-out a southbound right turn lane is required to be 315 feet.
2. Across the approximately 1,700 linear feet of frontage no signalized intersection may be closer than ¼ mile or approved by the Greene County Engineer. In addition, a right-in/right-out access shall be located outside of the functional area of a signalized intersection. The functional area of the proposed right-in/right-out intersection is 365 feet (50' + 315' southbound right turn lane) upstream of the proposed access location.
3. The location of the proposed signalized intersection shall be determined by the functional area of the intersection which is defined by the required turn lane lengths and queues that are described within the study. At a minimum, no unsignalized intersection may be within 200 feet upstream of the signal.
4. Improvements that take regional effort include the Wright Patt Airforce Base (WPAFB), Ohio Department of Transportation (ODOT) and the Greene County Engineer. The improvements at the Gate 19B signalized intersection are caused by the WPAFB traffic and currently cause very long queues onto National Road in both directions. These improvements shall be made a priority for the WPAFB for this development and other developments in the nearby area to continue to be successful.

Should you have any questions, please contact me, by phone at 513-907-0943 or via email at lindsey.kieres@goodhueconsulting.com.

8.0 Recommendations Summary

Table 24 summarizes the proposed improvements identified in this study and responsibility for each modification as described in Section 7.0 .

Table 24: Summary of Improvements

Intersection	Improvement	Responsibility	Year Required
National Road & North Development Access	Locate this intersection as to maximize distance between the proposed traffic signal and Reese/WPAFB Gate 19B intersection. The Greene County Engineer requires that traffic signals be spaced approximately ¼ mile (1,320') from adjacent traffic signals. Flip this access with the proposed right-in/right-out site access if necessary to maximize spacing of signalized intersections.	**Development**	**2025/OY**
	Construct a northbound left turn lane of 515' (including 50' taper). Construct a traffic signal. Provide protected-permitted left turn phasing.		**2025/OY**
	Provide separate left and right exit lanes with a minimum storage of 200' each and a minimum of one site entry lane. Provide right turn overlap phasing for eastbound right lane.		**2025/OY**
National Road & South Development Access	Provide a single right turn exit lane with a minimum storage of 200' and a minimum of one site entry lane. Construct the south access as to prohibit left turns into or out of the development at this location.	**Development**	**2025/OY**
Colonel Glenn & National Road	Capacity improvements are shown to be needed at this intersection by 2045 even before the proposed development traffic is added. Widen the southbound approach to provide a third through/right lane as proposed in the ongoing IMS related improvements.	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	2045/DY
National Road section from Colonel Glenn to Reese/WPAFB Gate 19B	Capacity improvements are shown to be needed in this section by 2045 even before the proposed development traffic is added. Widen to accommodate a 5-lane section on National Road stretching from the IMS related improvements at the Colonel Glenn & National intersection to Reese/WPAFB Gate 19B	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	2045/DY
National Road & Reese/WPAFB Gate 19B	With current WPAFB gate operations, capacity improvements are shown to be needed at this intersection by 2025 even before the proposed development traffic is added. Widen to allow for a northbound dual left turn movement and a southbound dual right turn movement into WPAFB Gate 19B. Additional consideration may be necessary within the Base to allow for queuing of these vehicles for processing during the peak entering times.	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	**2025/OY**
National Road & Kauffman Road	Modify the existing traffic signal equipment (existing roadway geometry to remain) to provide an eastbound right overlap phase to run with the northbound left turn phase. Ensure this improvement does not negatively impact any safety-related improvements currently being considered at this intersection.	**Development**	**2025/OY**
	Capacity improvements are shown to be needed at this intersection by 2045 even before the proposed development traffic is added. Widen the northbound approach for dual left dual left turn lanes and a right turn bay. The dual left necessitates widening of Kauffman west of the intersection to accept two lanes of turning vehicles. Ensure these improvements do not negatively impact any safety-related improvements being considered for the future of this intersection.	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	2045/DY

OY = Opening Year of Development DY = Design Year (Opening Day + 20 Years)

MEMORANDUMD

To: Sara Senger, P.E., PTOE, TEC Engineering
From: Lindsey Kieres, P.E., PTOE
Cc: Stephanie Goff, P.E., P.S., Greene County Engineer
Jeff Moorman, P.E., City of Beavercreek Engineer & Public Service Director
Nick Smith, P.E., CPMSM, City of Beavercreek Assistant Engineer
Paul Goodhue, P.E., PTOE
Date: September 5, 2024
Subject: Proposed WPAFB Gerlaugh Traffic Impact Study Review Comments

Goodhue Consulting, on behalf of the Greene County Engineer and the City of Beavercreek, has reviewed the revised proposed WPAFB Gerlaugh Development Traffic Impact Study, dated August 12, 2024. The submittal followed a Traffic Impact Study submittal dated June 06, 2024, Volume Submittal, dated April 05, 2024, and the Memorandum of Understanding dated March 6, 2024, approved with comments on March 25, 2024.

After review of this revised Traffic Impact Study dated August 12, 2024, Goodhue Consulting recommends conditional approval. The following are conditions that are recommended to be required by the development along with the Recommendations listed on page 10 of the report and attached to this recommendation memo:

1. A QSR over 1.0 remains concerning and is attributed to the Gerlaugh-generated traffic. It is understood that the 1.04 QSR for the westbound left is barely over 1.0 but full buildout of the remaining undeveloped land on Mission Point will necessitate improvements to be made to mitigate any storage issues that arise in the future. These improvements are not fully known until a more refined site plan is offered. However, as part of the site plan submission and subsequent review, the developer should provide additional analysis to identify improvements that will mitigate the future QSR over 1.0 and offer a plan when the improvements will be triggered for implementation.
2. No changes were made to the study to address this comment previously made: 'After reviewing the Mission Point Development's master plan a median was planned to prohibit movements and promote access management. Cutting the existing median is not acceptable. The developer is encouraged to investigate alternative access schemes since a right-in/right-out will be the only movements permitted at the proposed access points on Mission Point. This may include making improvements to the south to allow for safe U-turn movements.'
    a. After reviewing the response to comments included in the August 12 2024 submittal, a loon is expected to be an acceptable solution to accommodate the u-turn traffic. If all vehicle types that will access the facilities can make the movement without a loon, the construction of a loon is not required. As part of the site plan submittal and review process, once a more refined site plan is known, the u-turn movement needs to be analyzed and accommodated for.

Should you have any questions, please contact me, by phone at 513-907-0943 or via email at lindsey.kieres@goodhueconsulting.com.

7.0 Conclusions & Recommendations Summary

Traffic impact analysis for the Gerlaugh parcel was completed for the 2030 opening year and 2050 design year with the background assumption that the full buildout of the Mission Point development is constructed as originally envisioned in the 2008 traffic study for the development. At present, one 90,000sf office building from the original plan is in operation, the remainder of the site continues to be undeveloped. Of the additional development related trips added to the certified traffic for the intersection of Colonel Glenn Highway & Mission Point Boulevard, the Gerlaugh parcel represents 17% of the additional trips in the AM and 14% in the PM peak hour while the original Mission Point development trips make up the remaining 83% and 86%, respectively. Capacity analysis results indicate the intersection Colonel Glenn Highway & Mission Point Boulevard would be approaching capacity for the westbound left movement in the AM peak hour in this "worst case" development scenario however this intersection can support the additional trips associated with the proposed Gerlaugh parcel. As development occurs and network traffic volumes change over time, it is recommended that the timing at the intersection be monitored and adjusted to ensure optimal operation particularly during the potentially heavy inbound movement during the AM peak hour. No improvements are recommended at the intersection of Colonel Glenn Highway & Mission Point Boulevard for opening day of the proposed development.

Providing access to the proposed Gerlaugh parcel development is challenging due to the limited distance (approximately 175') between Colonel Glenn Highway and the property line on Mission Point Boulevard. Currently, a landscaped median exists in the vicinity of the proposed access location. Turn lane length calculations using ODOT criteria yield a southbound left turn bay distance requirement of 225' (including taper). Queuing results from SimTraffic indicate this distance could be shortened to closer to 100'. Currently, there is only one building from the initial Mission Point development. In the short term, a break in the landscaped median could be considered to serve the proposed Gerlaugh development site as traffic volumes on Mission Point are currently very low.

Once additional development occurs on Mission Point Boulevard south of the proposed site, at that time it would be reasonable to close the median break at the Gerlaugh development access and modify the first existing internal intersection on Mission Point Boulevard to either allow for either a u-turn for vehicles accessing the Gerlaugh development, or convert this intersection to a roundabout to serve higher volumes of development traffic south on Mission Point Boulevard.

TEC Engineering, Inc.

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Appendix B
Construction Noise Analysis

ENHANCED USE LEASE (EUL) SITES
CONSTRUCTION NOISE ANALYSIS

1. General Information: The US Department of Transportation (DOT) Federal Highway Administration (FHA) Roadway Construction Noise Model[1] was used to perform a noise analysis to assess the potential impacts associated with the proposed action. This report provides a summary of the construction noise analysis.

a. Action Location:

Base: WRIGHT-PATTERSON AFB
State: Ohio
County(s): Greene; Montgomery

b. Action Title: NEPA ENVIRONMENTAL ASSESSMENT FOR ENHANCED USE LEASE (EUL) SITES AT WRIGHT-PATTERSON AIR FORCE BASE

c. Project Number/s (if applicable):

d. Projected Action Start Date: 6 / 2025

e. Action Description: The work will consist of providing technical support for the preparation of an environmental assessment (EA) of construction projects for two enhanced use lease (EUL) sites at Wright-Patterson Air Force Base, Ohio (**Figure 1**). The first site is the Hilltop Campus, which is currently located within the base fence along National Road in Area B. The second site is the former Gerlaugh Farm property at Mission Pointe on Colonel Glenn Highway, which is outside the base fence.

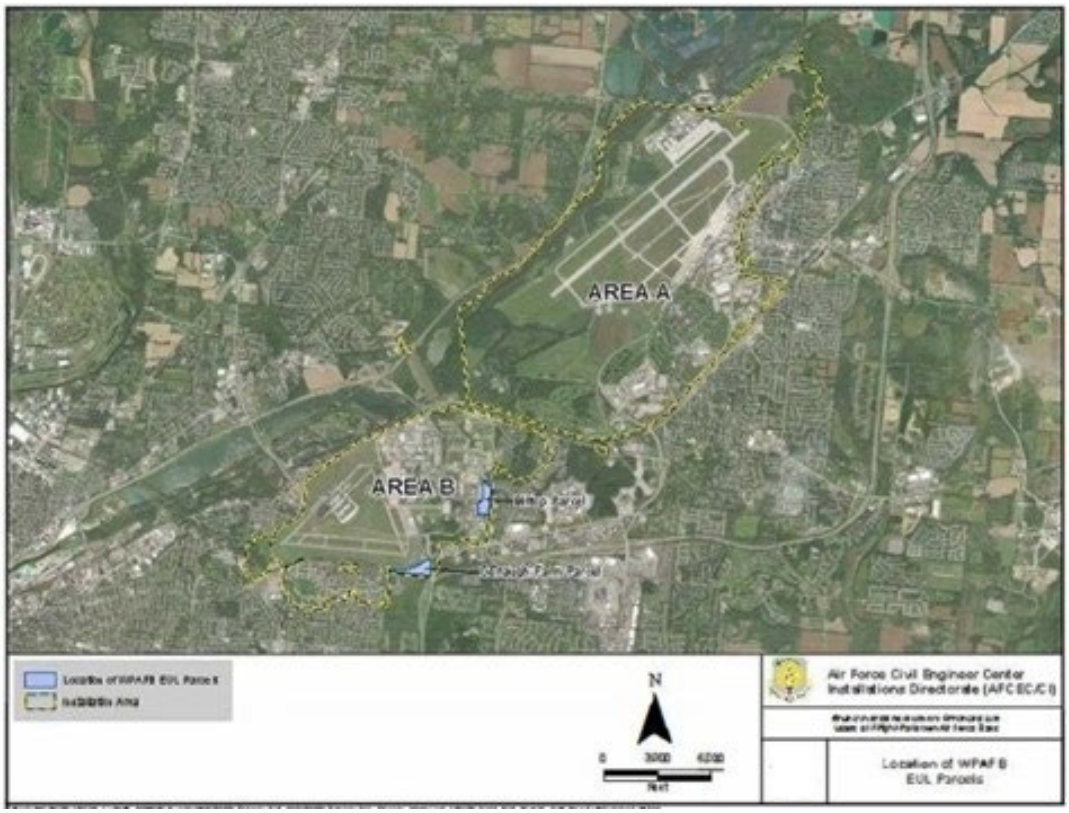
f. Point of Contact:

Name: Robert Kull
Title: Contractor
Organization: RCK Environmental Services, LLC (RCKES)
Email: rkull@rckes.com
Phone Number: 757-755-6259

2. Analysis: In December 2021 RCK Environmental Services, LLC (RCKES) was contracted to perform an ambient noise study in support of an environmental assessment at Wright-Patterson Air Force Base, Area B. Since two of the four sampling locations were adjacent to the two EUL sites, a brief description of the ambient noise study and the results are described in this report.

[1] FHWA-HEP-05-054 DOT-VNTSC-FHWA-0501, Final Report January 2006

Figure 1: Enhanced Use Lease Sites



Ambient Noise Study Site Locations: Figure 2 illustrates the approximate locations of the project sites and the sample locations relative to Area B, Wright-Patterson AFB. Site 2 is the approximate location of the Gerlaugh Farm EUL. Site 3 is the approximate location of Hilltop Campus EUL. The latitudes and longitudes for each site are listed in **Table 1**.

Sampling Equipment for the Ambient Noise Study: RCKES leased a single Larson Davis Class 1 Integrating Sound Level Meter (SLM)/Analyzer, microphone, preamplifier, windscreen and tripod. Data were downloaded to a Dell Latitude 4700 laptop. The microphone was calibrated prior to the collection of noise data. The SLM with a microphone and windscreen was mounted to a tripod and the microphone was positioned approximately 6 feet above the ground. A Garmin eTrex10 was used to obtain latitude and longitude for each location. An Extech 45160 Anemometer was used to collect wind velocity and air temperature data.

Noise Data Collection: One hour of ambient noise sampling was collected at each site. Weather and location data were noted for each site. Significant noise sources contributing to the ambient level were noted during each sampling event. Data were downloaded to the laptop using the G4 Larson Davis Utility 4.6.5.0 x64 and subsequently viewed in Excel spreadsheets.

Figure 2: Hilltop Campus and Gerlaugh Farm EUL Sites and the location of the ambient noise data collection sites.

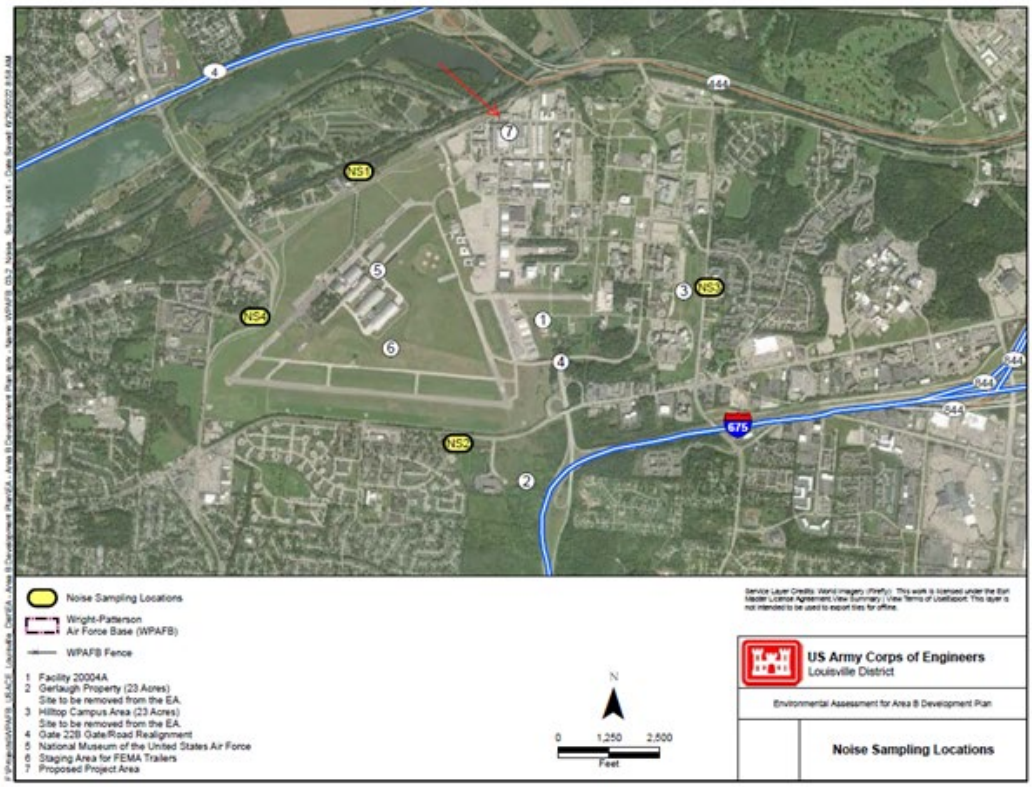


Table 1: Ambient Noise Sampling Sites

Sampling Site	Longitude	Latitude	Address	Environmental Noise Sources
1	-84.10822	39.78859	5915 Huberville Ave. Dayton, OH	Some automobiles along Springfield Rd; high altitude commercial aircraft; and jogger on nearby trail
2	-84.10086	39.77061	21 Gladecress Circle, Riverside, OH	Passing autos; barking dogs
3	-84.7866	39.78153	2348 National Rd, Beavercreek Township, OH	Constant flow of automobiles on National Rd.
4	-84.11909	39.77858	5173 Northcliff Dr., Dayton, OH	Fairly constant flow of automobiles on Springfield Rd

Table 2: Results of Ambient Noise Study for Sites 2 and 3

Sampling Site No.	L_{eq} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)	Date	Time of Day	Weather
2	62.3	65.5	61.2	53.3	12/8/2021	1055-1155	31°F; winds 2.5-4 mph; mostly clear skies
3	66.3	69.6	65.5	55.9	12/8/2021	1250-1350	37°F; winds 0-6 mph; mostly clear skies

Discussion from the Ambient Noise Study: Ambient noise, sometimes referred to as background noise, is a topic of study that started in 1970's where Schafer (1977)[2] describes the sonic (or sound) environment. He introduced the concept of "soundscapes". Kull (2006)[3] explains that a study of soundscapes is a multi-disciplined acoustic description of various types of ecosystems. A soundscape is actually part of a continuum of soundscapes from completely natural environments (without any human sounds contributing to the ambient level) to completely urban soundscapes, where human noise-causing events overwhelmingly contribute to the ambient noise levels. Most soundscapes fall somewhere in between these two extreme examples. The purpose of this study was to sample the ambient noise level near residences surrounding Area B, Wright-Patterson AFB. These levels can then be treated as a baseline for any additional construction noise of the Proposed Action.

This study used LA_{eq} as the sound level metric to measure the ambient noise. LA_{eq} represents the A-weighted equivalent continuous sound pressure level. The SLM used in the survey was programmed to collect 1-second LA_{eq}'s for one hour at each sampling location and then provide an average LA_{eq} for that hour. The $LA_{eq(1hr)}$ for the four sampling locations ranged from 53.1-66.3 dBA. The Results Table also lists the L_{10}, L_{50}, and L_{90} levels. L_{10} is the level of noise exceeded 10% of the surveyed time. L_{90} is the noise exceeded 90% of the time. Typically, the L_{90} is considered the background level for a soundscape. From the Results Table, L_{10} ranged from 57.6 to 69.6 dBA. Contrasting that with the L_{90} level that ranged from 41.9 to 55.9 dBA. For a comparison, King et al. (2012)[4] reported LAeqs ranging from 56.0 – 64.1 dBA during the mornings and afternoons for two neighborhoods in Nova Scotia, Newfoundland, Canada. One site was more residential and the other mixed residential and commercial. Their L_{90} levels ranged from 43.9 to 54.6 dBA. Lee et al. (2014)[5] measured ambient noise levels for three US cities, Atlanta, Los Angeles, and New York City. The mean noise levels measured 69.2, 66.4, and 65.1 dBA respectively. These references can give the reader confidence that the ambient levels of the current study align with other urban areas.

Analysis of Construction Noise at Hilltop Campus Location: **Table 3** is a list of the planned construction activities, and the month and year for the start of each activity for each building. Each activity has a list of the general equipment taken from the ACAM model[6] for consistency in planned equipment usage. Noise from each type of equipment was calculated using the Federal Highway Administration (FHWA) Roadway Construction Noise Model to the assumed closest residence. The distance calculated from the construction site to the residence is 135 feet. **Table 3** lists the L_{Amax}[7] and the L_{Aeq} dBA for each type of equipment. Graders are the loudest

[2] Schafer, R. M. 1977. *Our Sonic Environment and the Soundscape: The Tuning of the World. Destiny Books*, Rochester, Vermont.

[3] Kull, Robert C. 2006. Natural and Urban Soundscapes: The Need for a Multi-Disciplinary Approach. *Acta Acustica United with Acustica*. 92: 898-902.

[4] King, Gavin, Marek Roland-Mieszkowski, Timothy Jason, and Daniel G. Rainham. 2012. Noise Levels Associated with Urban Land Use. *Journal of Urban Health* 89 (6): 1017-1030.

[5] Lee, Eunice Y., Michael Jerrett, Zev Ross, Patricia F. Coogan, and Edmund Y. W. Seto. 2014. Assessment of Traffic-related Noise in Three Cities in the United States. *Environmental Research* 132: 182-189.

[6] Bryson, Russell 12 March 2024, BioLargo Engineering, Science & Technologies, LLC, *ACAM Detail Report_rev1*

[7] L_{Amax} is the maximum A-weighted sound pressure level for a particular noise event.

type of equipment, followed by tractors and loaders. These noise levels are approximately 10 dBA over the measured ambient level (**Table 2**). Generally, people perceive 10 dB as a doubling of the noise in a soundscape.

Table 3: Hilltop Campus Construction Timelines and Equipment

Building #	Activity	Start Month/ Year	Days[1]	Equipment	Calculated L_{Amax} (dBA)	Calculated L_{eq} (dBA)
1	Grading	6/2025	57	Graders	76.4	78.5
			57	Rubber tired dozers	73	72.4
			57	Tractors/loaders/backhoes	75.4	71.4
	Trenching	6/2025	57	Excavators	72.1	68.1
			57	Tractors/loaders/backhoes	75.4	71.4
	Construction	8/2026	304	Cranes	71.9	64.0
			304	Forklifts	66.1	59.1
			304	Generators	72.0	69.0
			304	Tractors/loaders/backhoes	75.4	71.4
	Paving	8/2026	43	Cement/mortar mixers	70.2	66.2
			43	Pavers	68.6	65.6
			43	Rollers	71.4	64.4
2	Grading	6/2026	57	Graders	76.4	78.5
			57	Rubber tired dozers	73	72.4
			57	Tractors/loaders/backhoes	75.4	71.4
	Trenching	6/2026	57	Excavators	72.1	68.1
			57	Tractors/loaders/backhoes	75.4	71.4
	Construction	2026	279	Cranes	71.9	64.0
			279	Forklifts	66.1	59.1
			279	Generators	72.0	69.0
			279	Tractors/loaders/backhoes	75.4	71.4
	Paving	6/2027	43	Cement/mortar mixers	70.2	66.2
			43	Pavers	68.6	65.6
			43	Rollers	71.4	64.4
4	Grading	6/2027	57	Graders	76.4	78.5
			57	Rubber tired dozers	73	72.4
			57	Tractors/loaders/backhoes	75.4	71.4
	Trenching	2027	57	Excavators	72.1	68.1
			57	Tractors/loaders/backhoes	75.4	71.4
	Construction	2027	304	Cranes	71.9	64.0
			304	Forklifts	66.1	59.1
			304	Generators	72.0	69.0
			304	Tractors/loaders/backhoes	75.4	71.4
	Paving	6/2028	43	Cement/mortar mixers	70.2	66.2
			43	Pavers	68.6	65.6
			43	Rollers	71.4	78.5
6	Grading	6/2027	57	Graders	76.4	72.4
			57	Rubber tired dozers	73	71.4
			57	Tractors/loaders/backhoes	75.4	68.1
	Trenching	6/2027	57	Excavators	72.1	71.4
			57	Tractors/loaders/backhoes	75.4	64.0
	Construction	2027	304	Cranes	71.9	59.1
			304	Forklifts	66.1	69.0
			304	Generators	72.0	71.4
			304	Tractors/loaders/backhoes	75.4	66.2

Building #	Activity	Start Month/ Year	Days[1]	Equipment	Calculated L_{Amax} (dBA)	Calculated L_{eq} (dBA)
	Paving	6/2028	43	Cement/mortar mixers	70.2	65.6
			43	Pavers	68.6	64.4
			43	Rollers	71.4	78.5
7	Grading	6/2028	57	Graders	76.4	78.5
			57	Rubber tired dozers	73	72.4
			57	Tractors/loaders/backhoes	75.4	71.4
	Trenching	6/2028	57	Excavators	72.1	68.1
			57	Tractors/loaders/backhoes	75.4	71.4
	Construction	2028	304	Cranes	71.9	64.0
			304	Forklifts	66.1	59.1
			304	Generators	72.0	69.0
			304	Tractors/loaders/backhoes	75.4	71.4
	Paving	6/2029	43	Cement/mortar mixers	70.2	66.2
			43	Pavers	68.6	65.6
			43	Rollers	71.4	64.4
9	Grading	6/2029	57	Graders	76.4	78.5
			57	Rubber tired dozers	73	72.4
			57	Tractors/loaders/backhoes	75.4	71.4
	Trenching	6/2029	57	Excavators	72.1	68.1
			57	Tractors/loaders/backhoes	75.4	71.4
	Construction	2029	304	Cranes	71.9	64.0
			304	Forklifts	66.1	59.1
			304	Generators	72.0	69.0
	Paving	6/2030	43	Cement/mortar mixers	70.2	66.2
			43	Pavers	68.6	65.6
			43	Rollers	71.4	64.4
11	Grading	6/2030	57	Graders	76.4	78.5
			57	Rubber tired dozers	73	72.4
			57	Tractors/loaders/backhoes	75.4	71.4
	Trenching	6/2030	57	Excavators	72.1	68.1
			57	Tractors/loaders/backhoes	75.4	71.4
	Construction	2030	304	Cranes	71.9	64.0
			304	Forklifts	66.1	59.1
			304	Generators	72.0	69.0
			304	Tractors/loaders/backhoes	75.4	71.4
	Paving	6/2031	43	Cement/mortar mixers	70.2	66.2
			43	Pavers	68.6	65.6
			43	Rollers	71.4	64.4

1 – Days represent number of working days based on preliminary project scheduled provided by construction developer.

Analysis of Construction Noise at Gerlaugh Farm Location: **Table 4** is a list of the planned construction activities, and the month and year for the start of each activity for each building. Each activity has a list of the general equipment taken from the ACAM model for consistency in planned equipment usage. Noise from each type of equipment was calculated using the FHWA Roadway Construction Noise Model to the assumed closest residence. The distance calculated from the construction site to the residence varied. Building 5 was estimated to be 63 feet from the first residence; Building 8, 780 feet; Building 10, 1,005 feet; and Building 12 1,125 feet. **Table 4** lists the L_{Amax} dBA and the L_{Aeq} dBA for each type of equipment. As with the Hilltop Campus location, graders are the loudest type of equipment from Building 5, followed by

tractors and loaders. These noise levels are approximately 20 dBA over the measured ambient level (**Table 2**). Generally, people perceive 10 dB as a doubling of the noise in a soundscape. The levels drop off significantly for construction noise at Buildings 8, 10, and 12 to levels at or below ambient.

Table 4: Gerlaugh Farm Construction Timelines and Equipment

Building #	Activity	Start Month/ Year	Days[1]	Equipment	Calculated L_{Amax} (dBA)	Calculated L_{eq} (dBA)
5	Grading	6/2031	57	Graders	83.0	79.0
			57	Rubber tired dozers	79.7	75.7
			57	Tractors/loaders/backhoes	82.0	78.0
	Trenching	6/2031	57	Excavators	78.7	74.7
			57	Tractors/loaders/backhoes	82.0	78.0
	Construction	2031	304	Cranes	78.5	70.6
			304	Forklifts	72.7	65.7
			304	Generators	78.6	75.6
			304	Tractors/loaders/backhoes	82.0	78.0
	Paving	6/2032	43	Cement/mortar mixers	76.8	72.8
			43	Pavers	75.2	72.2
			43	Rollers	78.0	71.0
8	Grading	5/2032	57	Graders	61.1	57.2
			57	Rubber tired dozers	57.8	53.8
			57	Tractors/loaders/backhoes	60.1	56.2
	Trenching	5/2032	57	Excavators	56.8	52.9
			57	Tractors/loaders/backhoes	60.1	56.2
	Construction	2032	304	Cranes	56.7	48.7
			304	Forklifts	50.8	43.8
			304	Generators	56.8	53.8
			304	Tractors/loaders/backhoes	60.1	56.2
	Paving	6/2033	43	Cement/mortar mixers	54.9	51.0
			43	Pavers	53.4	503
			43	Rollers	56.1	49.1
10	Grading	5/2033	57	Graders	58.9	55.0
			57	Rubber tired dozers	55.6	51.6
			57	Tractors/loaders/backhoes	57.9	54.0
	Trenching	5/2033	57	Excavators	54.6	50.7
			57	Tractors/loaders/backhoes	57.9	54.0
	Construction	2033	304	Cranes	54.5	46.5
			304	Forklifts	48.6	41.6
			304	Generators	54,6	51.6
			304	Tractors/loaders/backhoes	57.9	54.0
	Paving	6/2034	43	Cement/mortar mixers	52.7	48.8
			43	Pavers	51.2	48.1
			43	Rollers	53.9	46.9
12	Grading	5/2034	57	Graders	58.0	54.0
			57	Rubber tired dozers	54.6	50.6
			57	Tractors/loaders/backhoes	57.0	53.0
	Trenching	5/2034	57	Excavators	53.7	49.7
			57	Tractors/loaders/backhoes	57.0	53.0
	Construction	2034	304	Cranes	53.5	45.5
			304	Forklifts	47.7	40.7

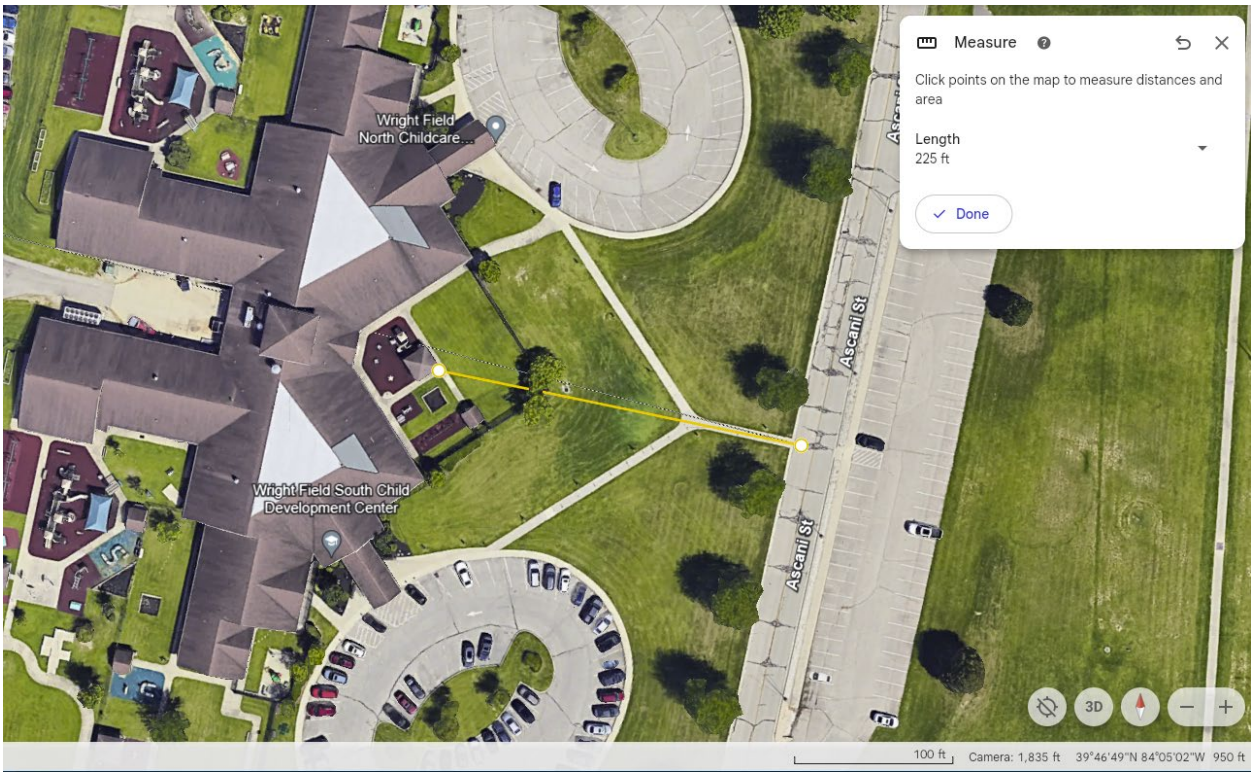
Building #	Activity	Start Month/ Year	Days[1]	Equipment	Calculated L_{Amax} (dBA)	Calculated L_{eq} (dBA)
			304	Generators	53.6	50.6
			304	Tractors/loaders/backhoes	57.0	53.0
	Paving	6/2035	43	Cement/mortar mixers	51.8	47.8
			43	Pavers	50.2	47.2
			43	Rollers	53.0	46.0

1 – Days represent number of working days based on preliminary project scheduled provided by construction developer.

Potential Noise Impacts from Hilltop Campus EUL Construction: All construction operations will occur during the day, Monday through Friday. There will be no construction operations on weekends nor will there be construction noise in the evenings or nights. Residents nearest the construction site may experience as much as 10 dBA levels higher than ambient while outside during construction operations. Impacts would primarily be interruptions in speech while two or more residents are talking or while talking on a mobile phone. Noise levels will not be high enough to cause temporary hearing impairment. Interior noise levels typically attenuate exterior noise by 15 to 25 dBA depending on many factors, including home construction, window construction, whether the windows are open or closed, other interior noise like TVs radios, etc. Other factors that must be factored into the overall soundscape is the vehicle noise from National Road. The ambient noise study referred to earlier included traffic noise from National Road. Any additional noise from construction workers' vehicles arriving to and leaving from the job site would add to the ambient level, but it's uncertain as to how it would affect the noise levels since the speed of the traffic would slow down and the number of vehicles would increase. Presumably, automobile noise contributing to the overall soundscape may increase by 1-3 dBA during rush hour traffic, but not perceived as an increase since most people have difficulty distinguishing differences less than 3 dB.

West of the Hilltop Campus construction site is the Wright Field Child Development Center (see **Figure 3** below). The Center is located approximately 225 feet west of Ascani Street. Children outside the Development Center may experience construction noise between 55-66 Leq dBA (Lmax 61-68 dBA). Children playing on the playgrounds behind the building would experience levels lower than this, except for the fact that the noise from children playing would be higher. Inside the Child Development Center, the construction noise would be attenuated by at least 20 dB. Therefore, there would be no effects of construction noise disrupting classroom teaching and learning.

Figure 3: Wright Field Child Development Center Location
Relative to Hilltop Campus EUL Construction Site - West Boundary



Potential Noise Impacts from Gerlaugh Farm EUL Construction: As with the Hilltop Campus construction, all operations will be restricted to weekdays. Residents nearest the construction site of Building 5 may experience as much as 20 dBA levels higher than ambient while outside during construction operations. Impacts would primarily be interruptions in speech while two or more residents are talking or while talking on a mobile phone. Noise levels will not be high enough to cause temporary hearing impairment. Interior noise levels typically attenuate exterior noise by 15 to 25 dBA depending on many factors, including home construction, window construction, whether the windows are open or closed, other interior noise like TVs radios, etc. Other factors that must be factored into the overall soundscape is the vehicle noise from Colonel Glenn Highway. The ambient noise study referred to earlier included traffic noise from the highway. Any additional noise from construction workers' vehicles arriving to and leaving from the job site would add to the ambient level, but it's uncertain as to how it would affect the noise levels since the speed of the traffic would slow down and the number of vehicles would increase. Construction noise from operations at Building 8, 10, and 12 would be at or below ambient levels for residents outside of their homes and should have no impact from the noise.

Appendix C
Air Conformity Applicability Model Reports

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

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

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: WRIGHT-PATTERSON AFB
State: Ohio
County(s): Greene; Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA; Dayton-Springfield, OH

b. Action Title: NEPA ENVIRONMENTAL ASSESSMENT FOR ENHANCED USE LEASE (EUL) SITES AT WRIGHT-PATTERSON AIR FORCE BASE

c. Project Number/s (if applicable):

d. Projected Action Start Date: 6 / 2025

e. Action Description:

The work will consist of providing technical support for the preparation of an environmental assessment (EA) of construction projects for two enhanced use lease (EUL) sites at Wright-Patterson Air Force Base, Ohio. The first site is the Hilltop Campus, which is currently located within the base fence along National Road in Area B. The second site is the former Gerlaugh Farm property at Mission Pointe on Colonel Glenn Highway, which is outside the base fence.

Action will include:

Completion of a general conformity applicability analysis using the United State Air Force (USAF) Air Conformity Applicability Model (ACAM) program. The results of the ACAM modeling will determine the applicability of the General Conformity Rule (40 CFR 93, Subpart B) to the planned project activities. ACAM will provide all data inputs for construction phases/activities, and results for direct and indirect air emissions.

f. Point of Contact:

Name: Russell Bryson
Title: Contractor
Organization: BioLargo Engineering, Science & Technologies, LLC
Email: russell.bryson@biolargo.com
Phone Number: 865-250-6345

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile*

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

Sources, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.252		
NOx	1.370		
CO	2.912		
SOx	0.003		
PM 10	7.380		
PM 2.5	0.052		
Pb	0.000		
NH3	0.018		
Dayton-Springfield, OH			
VOC	0.252	100	No
NOx	1.370	100	No
CO	2.912		
SOx	0.003		
PM 10	7.380		
PM 2.5	0.052		
Pb	0.000		
NH3	0.018		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.967		
NOx	3.223		
CO	12.010		
SOx	0.010		
PM 10	4.579		
PM 2.5	0.112		
Pb	0.000		
NH3	0.108		
Dayton-Springfield, OH			
VOC	0.967	100	No
NOx	3.223	100	No
CO	12.010		
SOx	0.010		
PM 10	4.579		
PM 2.5	0.112		
Pb	0.000		
NH3	0.108		

2027

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

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.369		
NOx	4.926		
CO	17.316		
SOx	0.017		
PM 10	9.356		
PM 2.5	0.179		
Pb	0.000		
NH3	0.148		
Dayton-Springfield, OH			
VOC	1.369	100	No
NOx	4.926	100	No
CO	17.316		
SOx	0.017		
PM 10	9.356		
PM 2.5	0.179		
Pb	0.000		
NH3	0.148		

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	1.766		
NOx	5.253		
CO	22.948		
SOx	0.022		
PM 10	3.708		
PM 2.5	0.193		
Pb	0.000		
NH3	0.215		
Dayton-Springfield, OH			
VOC	1.766	100	No
NOx	5.253	100	No
CO	22.948		
SOx	0.022		
PM 10	3.708		
PM 2.5	0.193		
Pb	0.000		
NH3	0.215		

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.070		
NOx	4.420		
CO	27.531		
SOx	0.024		
PM 10	4.551		
PM 2.5	0.188		

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RECORD OF CONFORMITY ANALYSIS (ROCA)

Pb	0.000		
NH3	0.288		
Dayton-Springfield, OH			
VOC	2.070	100	No
NOx	4.420	100	No
CO	27.531		
SOx	0.024		
PM 10	4.551		
PM 2.5	0.188		
Pb	0.000		
NH3	0.288		

2030

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.296		
NOx	4.718		
CO	30.606		
SOx	0.027		
PM 10	6.761		
PM 2.5	0.205		
Pb	0.000		
NH3	0.324		
Dayton-Springfield, OH			
VOC	2.296	100	No
NOx	4.718	100	No
CO	30.606		
SOx	0.027		
PM 10	6.761		
PM 2.5	0.205		
Pb	0.000		
NH3	0.324		

2031

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.523		
NOx	4.872		
CO	33.575		
SOx	0.030		
PM 10	4.157		
PM 2.5	0.220		
Pb	0.000		
NH3	0.364		
Dayton-Springfield, OH			
VOC	2.523	100	No
NOx	4.872	100	No
CO	33.575		
SOx	0.030		
PM 10	4.157		
PM 2.5	0.220		

AIR CONFORMITY APPLICABILITY MODEL REPORT
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Pb	0.000		
NH3	0.364		

2032

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.746		
NOx	5.174		
CO	36.479		
SOx	0.034		
PM 10	4.181		
PM 2.5	0.245		
Pb	0.000		
NH3	0.400		
Dayton-Springfield, OH			
VOC	2.746	100	No
NOx	5.174	100	No
CO	36.479		
SOx	0.034		
PM 10	4.181		
PM 2.5	0.245		
Pb	0.000		
NH3	0.400		

2033

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.939		
NOx	5.445		
CO	38.891		
SOx	0.037		
PM 10	6.161		
PM 2.5	0.261		
Pb	0.000		
NH3	0.430		
Dayton-Springfield, OH			
VOC	2.939	100	No
NOx	5.445	100	No
CO	38.891		
SOx	0.037		
PM 10	6.161		
PM 2.5	0.261		
Pb	0.000		
NH3	0.430		

2034

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.066		
NOx	5.353		

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CO	40.502		
SOx	0.038		
PM 10	2.245		
PM 2.5	0.271		
Pb	0.000		
NH3	0.455		
Dayton-Springfield, OH			
VOC	3.066	100	No
NOx	5.353	100	No
CO	40.502		
SOx	0.038		
PM 10	2.245		
PM 2.5	0.271		
Pb	0.000		
NH3	0.455		

2035

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.000		
NOx	4.090		
CO	39.663		
SOx	0.036		
PM 10	0.264		
PM 2.5	0.256		
Pb	0.000		
NH3	0.469		
Dayton-Springfield, OH			
VOC	3.000	100	No
NOx	4.090	100	No
CO	39.663		
SOx	0.036		
PM 10	0.264		
PM 2.5	0.256		
Pb	0.000		
NH3	0.469		

2036

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.987		
NOx	3.820		
CO	39.348		
SOx	0.036		
PM 10	0.260		
PM 2.5	0.252		
Pb	0.000		
NH3	0.472		
Dayton-Springfield, OH			
VOC	2.987	100	No
NOx	3.820	100	No

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

CO	39.348		
SOx	0.036		
PM 10	0.260		
PM 2.5	0.252		
Pb	0.000		
NH3	0.472		

2037 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	2.987		
NOx	3.823		
CO	39.355		
SOx	0.036		
PM 10	0.260		
PM 2.5	0.252		
Pb	0.000		
NH3	0.472		
Dayton-Springfield, OH			
VOC	2.987	100	No
NOx	3.823	100	No
CO	39.355		
SOx	0.036		
PM 10	0.260		
PM 2.5	0.252		
Pb	0.000		
NH3	0.472		

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

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

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

Russell Bryson, Contractor — Mar 12 2024

Name, Title — **Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions and SC GHG analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: WRIGHT-PATTERSON AFB
State: Ohio
County(s): Greene; Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA; Dayton-Springfield, OH

b. Action Title: NEPA ENVIRONMENTAL ASSESSMENT FOR ENHANCED USE LEASE (EUL) SITES AT WRIGHT-PATTERSON AIR FORCE BASE

c. Project Number/s (if applicable):

d. Projected Action Start Date: 6 / 2025

e. Action Description:

The work will consist of providing technical support for the preparation of an environmental assessment (EA) of construction projects for two enhanced use lease (EUL) sites at Wright-Patterson Air Force Base, Ohio. The first site is the Hilltop Campus, which is currently located within the base fence along National Road in Area B. The second site is the former Gerlaugh Farm property at Mission Pointe on Colonel Glenn Highway, which is outside the base fence.

Action will include:

Completion of a general conformity applicability analysis using the United State Air Force (USAF) Air Conformity Applicability Model (ACAM) program. The results of the ACAM modeling will determine the applicability of the General Conformity Rule (40 CFR 93, Subpart B) to the planned project activities. ACAM will provide all data inputs for construction phases/activities, and results for direct and indirect air emissions.

f. Point of Contact:

Name: Russell Bryson
Title: Contractor
Organization: BioLargo Engineering, Science & Technologies, LLC
Email: russell.bryson@biolargo.com
Phone Number: 865-250-6345

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

GHG Emissions Analysis Summary:

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

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

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2025	359	0.0156996	0.00594967	361	68,039	No
2026	1,322	0.05944476	0.02269578	1,330	68,039	No
2027	2,251	0.0902749	0.03451658	2,262	68,039	No
2028	3,098	0.11905737	0.04921813	3,112	68,039	No
2029	3,889	0.14219671	0.06368899	3,905	68,039	No
2030	4,406	0.15897487	0.0733372	4,425	68,039	No
2031	4,957	0.17553859	0.08356558	4,978	68,039	No
2032	5,592	0.19305186	0.09152392	5,614	68,039	No
2033	6,066	0.20725264	0.09979522	6,090	68,039	No
2034	6,431	0.21695397	0.10663516	6,457	68,039	No
2035	6,476	0.21288896	0.10762228	6,499	68,039	No
2036	6,455	0.21052692	0.10807507	6,479	68,039	No
2037 [SS Year]	6,456	0.21057826	0.10808932	6,480	68,039	No
2038	6,456	0.21057826	0.10808932	6,480	68,039	No
2039	6,456	0.21057826	0.10808932	6,480	68,039	No
2040	6,456	0.21057826	0.10808932	6,480	68,039	No
2041	6,456	0.21057826	0.10808932	6,480	68,039	No
2042	6,456	0.21057826	0.10808932	6,480	68,039	No
2043	6,456	0.21057826	0.10808932	6,480	68,039	No
2044	6,456	0.21057826	0.10808932	6,480	68,039	No
2045	6,456	0.21057826	0.10808932	6,480	68,039	No
2046	6,456	0.21057826	0.10808932	6,480	68,039	No
2047	6,456	0.21057826	0.10808932	6,480	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	199,548,422	802,236	39,448	200,390,106
2026	199,548,422	802,236	39,448	200,390,106
2027	199,548,422	802,236	39,448	200,390,106
2028	199,548,422	802,236	39,448	200,390,106
2029	199,548,422	802,236	39,448	200,390,106
2030	199,548,422	802,236	39,448	200,390,106
2031	199,548,422	802,236	39,448	200,390,106
2032	199,548,422	802,236	39,448	200,390,106
2033	199,548,422	802,236	39,448	200,390,106
2034	199,548,422	802,236	39,448	200,390,106
2035	199,548,422	802,236	39,448	200,390,106
2036	199,548,422	802,236	39,448	200,390,106
2037 [SS Year]	199,548,422	802,236	39,448	200,390,106
2038	199,548,422	802,236	39,448	200,390,106
2039	199,548,422	802,236	39,448	200,390,106
2040	199,548,422	802,236	39,448	200,390,106
2041	199,548,422	802,236	39,448	200,390,106
2042	199,548,422	802,236	39,448	200,390,106
2043	199,548,422	802,236	39,448	200,390,106
2044	199,548,422	802,236	39,448	200,390,106
2045	199,548,422	802,236	39,448	200,390,106
2046	199,548,422	802,236	39,448	200,390,106
2047	199,548,422	802,236	39,448	200,390,106

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2025	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2026	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2027	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2028	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2029	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2033	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2034	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2035	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2036	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2037 [SS Year]	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2038	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2039	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2040	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2041	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2042	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2043	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2044	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2045	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2046	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2047	5,136,454,179	25,626,912	1,500,708	5,163,581,798

GHG Relative Significance Assessment:

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2025-2047	State Total	4,589,613,695	18,451,436	907,301	4,608,972,432
2025-2047	U.S. Total	118,138,446,117	589,418,969	34,516,276	118,762,381,361
2025-2047	Action	122,323	4.118222	2.035606	122,792
Percent of State Totals		0.00266521%	0.00002232%	0.00022436%	0.00266419%
Percent of U.S. Totals		0.00010354%	0.00000070%	0.00000590%	0.00010339%

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00001385%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

Climate Change Assessment (as SC GHG):

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions affect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $])			
YEAR	**CO2**	**CH4**	**N2O**
2025	$83.00	$2,200.00	$30,000.00
2026	$84.00	$2,300.00	$30,000.00
2027	$86.00	$2,300.00	$31,000.00
2028	$87.00	$2,400.00	$32,000.00
2029	$88.00	$2,500.00	$32,000.00
2030	$89.00	$2,500.00	$33,000.00
2031	$91.00	$2,600.00	$33,000.00
2032	$92.00	$2,600.00	$34,000.00
2033	$94.00	$2,700.00	$35,000.00
2034	$95.00	$2,800.00	$35,000.00
2035	$96.00	$2,800.00	$36,000.00
2036	$98.00	$2,900.00	$36,000.00
2037 [SS Year]	$99.00	$3,000.00	$37,000.00
2038	$100.00	$3,000.00	$38,000.00
2039	$102.00	$3,100.00	$38,000.00
2040	$103.00	$3,100.00	$39,000.00
2041	$104.00	$3,200.00	$39,000.00
2042	$106.00	$3,300.00	$40,000.00
2043	$107.00	$3,300.00	$41,000.00
2044	$108.00	$3,400.00	$41,000.00
2045	$110.00	$3,500.00	$42,000.00
2046	$111.00	$3,500.00	$43,000.00
2047	$112.00	$3,600.00	$43,000.00

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

Action-Related Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$29.78	$0.03	$0.18	$29.99
2026	$111.05	$0.14	$0.68	$111.86
2027	$193.63	$0.21	$1.07	$194.91
2028	$269.54	$0.29	$1.57	$271.40
2029	$342.19	$0.36	$2.04	$344.58
2030	$392.12	$0.40	$2.42	$394.94
2031	$451.10	$0.46	$2.76	$454.31
2032	$514.49	$0.50	$3.11	$518.11
2033	$570.21	$0.56	$3.49	$574.26
2034	$610.99	$0.61	$3.73	$615.33
2035	$621.66	$0.60	$3.87	$626.13
2036	$632.60	$0.61	$3.89	$637.10
2037 [SS Year]	$639.18	$0.63	$4.00	$643.81
2038	$645.64	$0.63	$4.11	$650.38
2039	$658.55	$0.65	$4.11	$663.31

2040	$665.01	$0.65	$4.22	$669.88
2041	$671.46	$0.67	$4.22	$676.35
2042	$684.38	$0.69	$4.32	$689.39
2043	$690.83	$0.69	$4.43	$695.96
2044	$697.29	$0.72	$4.43	$702.44
2045	$710.20	$0.74	$4.54	$715.48
2046	$716.66	$0.74	$4.65	$722.04
2047	$723.11	$0.76	$4.65	$728.52

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

State's Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$16,562,518.99	$1,764,919.97	$1,183,436.40	$19,510,875.36
2026	$16,762,067.41	$1,845,143.61	$1,183,436.40	$19,790,647.42
2027	$17,161,164.25	$1,845,143.61	$1,222,884.28	$20,229,192.14
2028	$17,360,712.67	$1,925,367.24	$1,262,332.16	$20,548,412.08
2029	$17,560,261.09	$2,005,590.88	$1,262,332.16	$20,828,184.13
2030	$17,759,809.52	$2,005,590.88	$1,301,780.04	$21,067,180.44
2031	$18,158,906.36	$2,085,814.51	$1,301,780.04	$21,546,500.91
2032	$18,358,454.78	$2,085,814.51	$1,341,227.92	$21,785,497.22
2033	$18,757,551.62	$2,166,038.15	$1,380,675.80	$22,304,265.57
2034	$18,957,100.04	$2,246,261.78	$1,380,675.80	$22,584,037.63
2035	$19,156,648.47	$2,246,261.78	$1,420,123.68	$22,823,033.93
2036	$19,555,745.31	$2,326,485.42	$1,420,123.68	$23,302,354.41
2037 [SS Year]	$19,755,293.73	$2,406,709.05	$1,459,571.56	$23,621,574.35
2038	$19,954,842.15	$2,406,709.05	$1,499,019.44	$23,860,570.65
2039	$20,353,939.00	$2,486,932.69	$1,499,019.44	$24,339,891.13
2040	$20,553,487.42	$2,486,932.69	$1,538,467.32	$24,578,887.43
2041	$20,753,035.84	$2,567,156.32	$1,538,467.32	$24,858,659.48
2042	$21,152,132.68	$2,647,379.96	$1,577,915.20	$25,377,427.84
2043	$21,351,681.10	$2,647,379.96	$1,617,363.08	$25,616,424.14
2044	$21,551,229.52	$2,727,603.59	$1,617,363.08	$25,896,196.20
2045	$21,950,326.37	$2,807,827.23	$1,656,810.96	$26,414,964.56
2046	$22,149,874.79	$2,807,827.23	$1,696,258.84	$26,653,960.86
2047	$22,349,423.21	$2,888,050.86	$1,696,258.84	$26,933,732.92

U.S. Annual SC GHG ($K/yr [In 2020 $])				
YEAR	**CO2**	**CH4**	**N2O**	**GHG**
2025	$426,325,696.86	$56,379,205.70	$45,021,229.08	$527,726,131.63
2026	$431,462,151.04	$58,941,896.86	$45,021,229.08	$535,425,276.98
2027	$441,735,059.39	$58,941,896.86	$46,521,936.72	$547,198,892.97
2028	$446,871,513.57	$61,504,588.03	$48,022,644.35	$556,398,745.96
2029	$452,007,967.75	$64,067,279.20	$48,022,644.35	$564,097,891.30
2030	$457,144,421.93	$64,067,279.20	$49,523,351.99	$570,735,053.12
2031	$467,417,330.29	$66,629,970.37	$49,523,351.99	$583,570,652.65
2032	$472,553,784.47	$66,629,970.37	$51,024,059.62	$590,207,814.46
2033	$482,826,692.83	$69,192,661.54	$52,524,767.26	$604,544,121.62
2034	$487,963,147.01	$71,755,352.70	$52,524,767.26	$612,243,266.97
2035	$493,099,601.18	$71,755,352.70	$54,025,474.90	$618,880,428.78
2036	$503,372,509.54	$74,318,043.87	$54,025,474.90	$631,716,028.31

2037 [SS Year]	$508,508,963.72	$76,880,735.04	$55,526,182.53	$640,915,881.29
2038	$513,645,417.90	$76,880,735.04	$57,026,890.17	$647,553,043.11
2039	$523,918,326.26	$79,443,426.21	$57,026,890.17	$660,388,642.63
2040	$529,054,780.44	$79,443,426.21	$58,527,597.80	$667,025,804.45
2041	$534,191,234.62	$82,006,117.38	$58,527,597.80	$674,724,949.80
2042	$544,464,142.97	$84,568,808.54	$60,028,305.44	$689,061,256.96
2043	$549,600,597.15	$84,568,808.54	$61,529,013.08	$695,698,418.77
2044	$554,737,051.33	$87,131,499.71	$61,529,013.08	$703,397,564.12
2045	$565,009,959.69	$89,694,190.88	$63,029,720.71	$717,733,871.28
2046	$570,146,413.87	$89,694,190.88	$64,530,428.35	$724,371,033.10
2047	$575,282,868.05	$92,256,882.05	$64,530,428.35	$732,070,178.44

Relative Comparison of SC GHG:

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

Total SC-GHG ($K [In 2020 $])					
		CO2	**CH4**	**N2O**	**GHG**
2025-2047	State Total	$447,986,206.32	$53,428,940.96	$33,057,323.53	$534,472,470.81
2025-2047	U.S. Total	$11,531,339,631.86	$1,706,752,317.89	$1,257,592,998.97	$14,495,684,948.71
2025-2047	Action	$12,241.67	$12.33	$76.49	$12,330.49
Percent of State Totals		0.00273260%	0.00002308%	0.00023138%	0.00230704%
Percent of U.S. Totals		0.00010616%	0.00000072%	0.00000608%	0.00008506%

From a global context, the action's total SC GHG percentage of total global SC GHG for the same time period is: 0.00001140%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

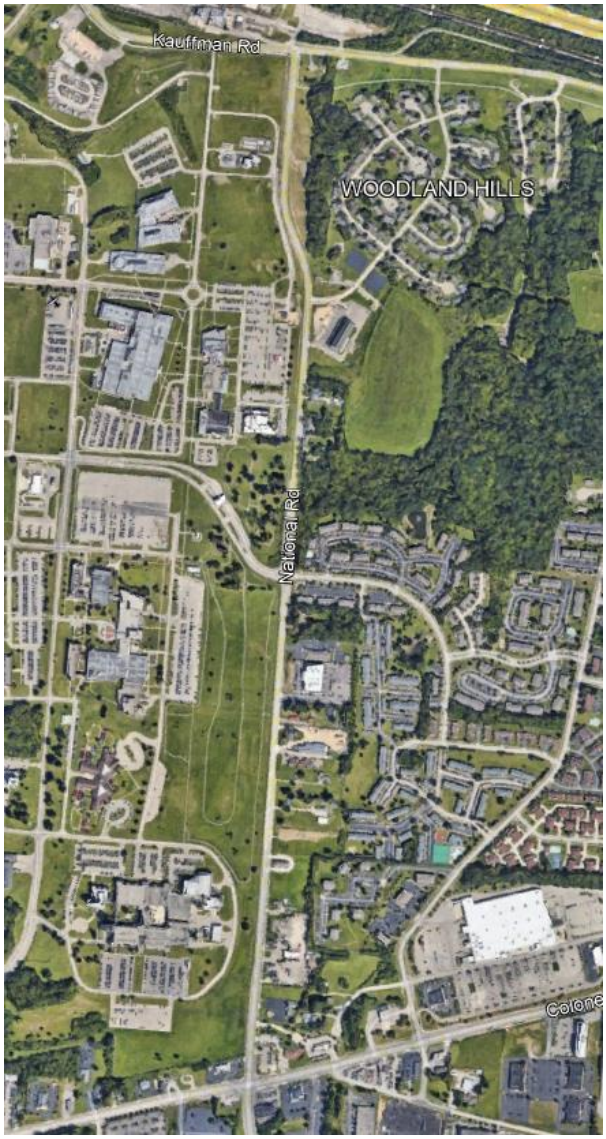
Russell Bryson, Contractor — Mar 15 2024

Name, Title — **Date**

Appendix D
Traffic Impact Study Reports

Traffic Analysis

Hilltop Parcel – Greene County, Ohio



Prepared By:

TEC Engineering, Inc.

Mason – Cincinnati – Dayton - Columbus

August 2024 – Version 1.2

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List of Appendix

Revision History

Date	Version	Description	Author
06/17/2024	1.0	Final Report	TEC
08/12/2024	1.1	Revised Final Report to address comments	TEC
08/21/2024	1.2	Revised Final Report to address 08/21/2024 comments	TEC

1.0 Introduction

TEC Engineering, Inc. was retained to conduct a Traffic Study for a proposed mixed use development with two proposed accesses located on National Rd between Reese Drive/WPAFB Gate 19B and Colonel Glenn Hwy, referred to as the "Hilltop Site".

At the time of this study, a separate interchange study is currently ongoing to evaluate impacts of completing the I-675 & Colonel Glenn interchange to provide enter/exit from both directions of I-675. This modification is expected to shift traffic volumes in the study area, particularly at the intersection of Colonel Glenn & National. This study takes into consideration current certified traffic volumes from the interchange study as well as preliminary improvements identified at the intersection of Colonel Glenn & National. Certified traffic volumes and preliminary improvement schematics are provided in ***Appendix A***.

The following sources were referenced:

- *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition*
- *State Highway Access Management Manual (SHAMM), February 2024 Edition*
- *ODOT Location and Design Manual, Volume One*

1.1 Study Area

The proposed development is located on land fronting National Road adjacent to Wright Patterson Air Force Base. National Road, which runs north-south in this area, is categorized as a Minor Arterial Road and has an existing speed limit of 35 mph from Colonel Glenn to the Beavercreek City limit and 50 mph north of the City limit. Colonel Glenn Hwy, which runs east-west in this area, is categorized as a Principal Arterial Road and has an existing speed limit of 45mph. Kauffman, which runs east-west in this area, is categorized as a Principal Arterial Road and has an existing speed limit of 45mph. The existing site is currently undeveloped.

The study limits include the adjacent roadway network and the following key intersections:

- Colonel Glenn Highway & National Road
- National Road & Reese Drive/WPAFB Gate 19B
- National Road & Kauffman Road
- National Road & Development Accesses

Figure 1: Study Area

1.2 Existing Volumes

Peak hour turning movement counts were recently collected for the study area intersections as part of the I-675 & Grange Hall Interchange Study. Traffic count data is provided in ***Appendix A***.

2.0 Proposed Site Development

The development consists of seven buildings including office buildings, a hotel, and potentially a small retail/restaurant component to support the office uses. A schematic of the development site plan is provided in ***Appendix B***.

3.0 Traffic Projections

3.1 Trip Generation

Total Trips

The proposed development is proposed to contain office type land uses. The *Institute of Transportation Engineers (ITE) Trip Generation Manual* (11th Edition) is the most widely accepted publication for projecting traffic volumes; specifically related to how the site is used. The trips generated by the development were projected using the trip generation fitted curve equations provided in the Web-based Trip Generation App for Land Use Code 750: Office Park, based on square footage of the proposed development. ***Table 1*** shows the total projected trips to be generated by the site during the average weekday AM and PM peak hours.

Table 1: Generated Trips

Land Use Type	Unit of Measure	Peak Hour Adjacent Street Traffic					
		Weekday AM			Weekday PM		
		Total	Enter	Exit	Total	Enter	Exit
750: Office Park	gsf = 345,000	518	461	57	456	64	392
310: Hotel	# rooms = 75	30	17	13	28	14	14
Total		**548**	**478**	**70**	**484**	**78**	**406**

3.2 Trip Distribution

For trip distribution, TEC evaluated the 2023 existing AM/PM volumes from the certified traffic plates for the I-675 & Grange Hall Interchange Study. The entering and exiting volumes at the WPAFB gate on National Road and the WPAFB gate at I-675 were examined and combined to get an understanding of how the base area is accessed regionally. General distribution for the proposed development site is expected to be similar in nature. Distribution calculations showing gate/intersection volume and percentage by movement are shown in ***Table 2***.

Table 2: Distribution Percentages

To/From Direction	Percentages								
	AM Entering		AM Exiting		PM Entering		PM Exiting		Rounded Average
To/From North (National & Reese)	630+260	32%	90+10	39%	50+10	33%	500+90	27%	30%
To/From South (National & I-675)	590+1330	68%	130+70	57%	30+90	67%	420+1210	73%	70%

Based on the averaged distribution percentages, at the proposed development accesses it is assumed that 30% of the development trips will be to/from the north on National Road and 70% to/from the south. Of

the 30% to/from the north, 20% is assumed to/from Kauffamn Ave while 10% is assumed to/from Reese Dr. Of the 70% to/from the south, 45% is assumed to/from I-675 and west on Colonel Glenn, 15% to/from the south on Grange Hall and 10% to/from the east on Colonel Glenn.

These distribution percentages were used in conjunction with the generated trips to assign vehicles to the individual driveways and adjacent intersections. A figure showing generated trips distributed through the network is included in ***Appendix C***.

3.3 Background Traffic

A 20-year design horizon will be analyzed. TEC has received 2035/2055 No Build and Build traffic plates developed for use in the I-675 & Grange Hall Interchange Study. These plates are included in ***Appendix A.*** Since the interchange study years differ from the traffic impact study years, TEC calculated the yearly growth by comparing the volume difference between the 2023 and 2035 No Build traffic plates. Two years of growth was added to the 2023 volumes to develop the 2025 No Build volumes. For the 2045 No Build volumes, TEC calculated the midpoint growth between the 2035 and 2055 No Build traffic plates. This midpoint represents the 2045 No Build volumes.

3.4 Scenario Evaluation

To determine any area modifications necessary to accommodate the traffic generated by the proposed Hilltop Parcel development, the following scenarios will be compared:

- *2025 Opening Year – No Build*
- *2025 Opening Year – Build*
- *2045 Design Year – No Build*
- *2045 Design Year – Build*

Volume diagrams for the analysis scenarios are provided in ***Appendix C***.

4.0 Sight Distance Analysis

An intersection sight distance (ISD) analysis was completed at the proposed access locations on Colonel Glenn Highway. Based on the area conditions, a design speed of 55 mph (50mph speed limit +5) was assumed for Colonel Glenn Highway. Based on the assumed design speeds, the recommended minimum sight distances from the *ODOT Location & Design Manual, Volume I (201-5E, 201-1E)* and the field measured sight distances are shown in the following table.

Table 3: Intersection Sight Distances

Approach	Intersection Sight Distance (ODOT L&D Manual)		Field Measured Sight Distance (ft)		Sight Distance Met?
	Movement	Colonel Glenn Design Speed – 55 mph	Looking Left	Looking Right	
North Development Access	Left Turn from Stop	610′	1000′	1000′	Yes
	Right Turn from Stop	530′			Yes
South Development Access	Left Turn from Stop	610′	1000′	1000′	Yes
	Right Turn from Stop	530′			Yes

The sight distance was measured from a point 17.8’ feet from the existing edge of traveled way. The measured distances indicate that the intersection sight distance requirements are met for the proposed access location.

5.0 Storage Lane Analysis

The ODOT Location & Design Manual, Volume One provides warrants to determine the need for separate turn lanes at unsignalized intersections. These warrants compare proposed traffic volumes and roadway speed characteristics to determine the need for storage lanes. Storage lane warrant analysis was performed for the uncontrolled movements impacted by development trips at the unsignalized intersection proposed accesses on National Road. The results of the warrant analysis have been summarized in ***Table 4*** below. The graphs associated with the intersection storage lane warrants have been included in ***Appendix D***.

Table 4: Turn Lane Warrant Summary

Intersection	Road/Direction	Movement	Year	Warranted?
National Road & Proposed North Access	National Road	NBL	2025 Build	**YES**
		SBR	2025 Build	**YES**
National Road & Proposed South Access	National Road	NBL	2025 Build	**YES**
		SBR	2025 Build	NO
			2045 Build	NO

The results of the storage lane analysis for unsignalized intersection operation indicate that a dedicated northbound left turn bay is warranted at both proposed accesses on National Road. In addition, a southbound right turn bay is warranted at the North Access.

The storage lengths for the warranted turn bays will be determined once overall intersection control is determined for the proposed accesses.

6.0 Capacity Analysis

The software program, *Synchro*, was used to analyze capacity at the study intersections. *Synchro* uses the methods prescribed in the Highway Capacity Manual to determine the Level-of-Service (LOS). LOS is defined in terms of delay and is a measure of driver discomfort and intersection performance with respect to vehicular capacity and quality of service provided to road users. Delay refers to total average stopped delay experienced by motorists at the referenced intersection. Synchro was chosen as the appropriate software choice for the ability to model consecutive signalized and unsignalized intersections in one network as well as evaluate queuing through the network. *SimTraffic* outputs are utilized for 95th percentile queue. QSR was calculated by dividing *SimTraffic* Max Queue by available Storage. The level of service is classified into six different levels, ranging from A to F. ***Table 5*** shows the definitions of each level for unsignalized and signalized intersections, respectively:

Table 5: LOS Definitions

Level of Service	Signalized Delay	Stop Control Delay	Description
A	<10 seconds per vehicle	<10 seconds per vehicle	Very low delay
B	10-20 seconds per vehicle	10-15 seconds per vehicle	Good Progression
C	20-35 seconds per vehicle	15-25 seconds per vehicle	Limit of acceptable delay
D	35-55 seconds per vehicle	25-35 seconds per vehicle	Start of traffic breakdown
E	55-80 seconds per vehicle	35-50 seconds per vehicle	High delay
F	>80 seconds per vehicle	>50 seconds per vehicle	Congested conditions, unacceptable delay

The goal of the Greene County Engineer for the operation of all roadways is an overall level of service "D" or better during the peak traffic (design) hour of the roadway system. In areas where current levels-of-service is worse than 'D', the base level-of-service must be maintained or improved after development. The operational goals for capacity analysis are:

- Intersection LOS: D or better
- Approach LOS: D or better
- Movement LOS: E or better
- Volume to Capacity Ratio (V/C): All movements below 1.0, less than 0.93 preferred
- Queue Storage Ratio (QSR): All movements less than 1.0

As stated in the Greene County 'Developer Traffic Study Requirements', if the "Build" condition significantly degrades (by one letter if LOS is D or above) the intersection compared to the "No Build" condition, mitigations shall be required to return the level of service to "No Build" levels.

A summary of the traffic analysis has been included in the following tables. Capacity analysis worksheets have been included in ***Appendix E***. *SimTraffic* queueing worksheets have been included in ***Appendix F***.

6.1 Proposed Access Traffic Control

Table 6: National Road & Proposed North Access 2025 Peak Hour Traffic Analysis (Unsignalized)

Int #5	Storage (ft)	2025 AM Build					Int #5	2025 PM Build				
National & North Access		LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBLR	200	E	44.3	0.35	0.97	167	EBLR	F	351.2	21.62	1.67	379
EB App	-	E	44.3	-	-	-	EB App	F	351.2	-	-	-
NBL	515	A	9.6	0.22	0.53	318	NBL	B	10.7	0.05	0.11	45
NB App	-	A	1.8	-	-	-	NB Appr	A	0.6	-	-	-
Intersection	-	A	2.4	-	-	-	Intersection	D	52.1	-	-	-

Table 7: National Road & Proposed South Access 2025 Peak Hour Traffic Analysis (Unsignalized)

Int #5	Storage (ft)	2025 AM Build					Int #5	2025 PM Build				
National & North Access		LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBLR	200	C	28.6	0.12	0.38	83	EBLR	F	112.2	0.95	0.96	138
EB App	-	C	28.6	-	-	-	EB App	F	112.2	-	-	-
NBL	515	A	8.9	0.14	0.15	83	NBL	B	11.4	0.04	0.11	45
NB App	-	A	1	-	-	-	NB App	A	0.5	-	-	-
Intersection	-	A	1.1	-	-	-	Intersection	A	9.2	-	-	-

Capacity analysis indicates the proposed development accesses cannot operate acceptably as unsignalized intersections. A higher level of capacity/ intersection control will be required for access to this development. A traffic signal warrant was completed for the North Access location. The warrant analysis utilizes 24-hour count data on National Road from 2022 as well as Vehicle Time of Day Distribution for General Office from the ITE Trip Generation Manual, 11th Edition. The analysis assumes right-in/right-out operation of the proposed South Access. Therefore, all left turns into and out of the development were assumed to occur at the north access. For signal warrant purposes, it was assumed that 75% of right turns would occur at the north access and 25% would occur at the right-in/right-out South Access. Conservative parameters were chosen including assuming the 35mph speed limit on National was extended north if this development occurs, and right turn on red reduction was applied. Based on this preliminary signal warrant analysis, the proposed North Access meets projected 8-hour, 4-hour and peak hour signal warrants for existing count data layered with proposed daily trips of the development. Traffic signal warrant outputs are provided in ***Appendix G***.

Alternatively, a roundabout could be considered for the North (main) Access location, again limiting the South Access to right-in/right-out configuration. HCS software was used to analyze capacity of a roundabout for the North Access. HCS Roundabout outputs are provided in ***Appendix H***.

Table 8: National Road & Proposed North Access 2025 Peak Hour Traffic Analysis (Roundabout)

Int #5	2025 AM Build Single Lane Roundabout					Int #5	2025 PM Build Single Lane Roundabout				
National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBLR	A	5	0.07	-	5.1	EBLR	D	26.5	0.68	-	130.6
NBLT	F	45.2	1.01	-	575	NBLT	A	9.3	0.54	-	82.5
SBTR	B	13.4	0.63	-	115.2	SBTR	C	18.5	0.82	-	261.1
Intersection	D	34.8	-	-	-	Intersection	C	16.9	-	-	-

Capacity analysis for a single lane roundabout at the North Access indicates additional lanes including a northbound left lane would be required for acceptable operations in the 2025 Opening Year as shown in the table below. The results were also checked for the 2045 Design Year.

Table 9: National & Proposed North Access w-Imp 2025 Peak Hour Traffic Analysis (Roundabout)

Int #5	2025 AM Build with NBL					Int #5	2025 PM Build with NBL				
National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBLR	A	5	0.07	-	5.1	EBL	D	26.5	0.68	-	130.6
NBLT	A	5	0.27	-	28.2	NBLT	A	3.4	0.05	-	5.1
NBT	B	12.4	0.71	-	166.4	NBT	A	7.8	0.47	-	64
NB App	B	10.4	-	-	-	NB App	A	7.4	-	-	-
SBTR	B	13.4	0.63	-	115.2	SBTR	C	18.5	0.82	-	261.1
Intersection	B	11.1	-	-	-	Intersection	C	16.3	-	-	-

Table 10: National & Proposed North Access w-Imp 2045 Peak Hour Traffic Analysis (Roundabout)

Int #5	2045 AM Build with NBL					Int #5	2045 PM Build with NBL				
National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBLR	A	5.4	0.07	-	5.1	EBL	E	47.5	0.84	-	197.1
NBLT	A	5	0.27	-	28.2	NBLT	A	3.4	0.05	-	5.1
NBT	C	19.4	0.85	-	294.4	NBT	A	9.3	0.55	-	89.6
NB App	C	15.9	-	-	-	NB App	A	8.8	-	-	-
SBTR	C	16.3	0.71	-	156.2	SBTR	E	38.2	0.98	-	501.8
Intersection	C	15.8	-	-	-	Intersection	D	30	-	-	-

By the 2045 Design Year, additional capacity may be required including two lanes for southbound traffic. This would require additional widening along National Road to accept these two lanes. An important consideration for the functionality of a roundabout at this location is the proximity to WPAFB. At times when different gates close for various reasons, traffic volumes at Gate 19 can fluctuate considerably. When queues arise for an adjacent intersection and extend into a roundabout, the roundabout becomes

gridlocked and loses its ability to service vehicles for any direction. For this reason, TEC does not recommend further consideration of a roundabout at the North Access. In the following analysis, a traffic signal will be evaluated for consideration at the North Access.

6.2 2025 Opening Year Traffic Analysis

The 2025 Opening Year Traffic Analysis assumes existing geometric conditions (no improvements related to the ongoing interchange study).

A. Colonel Glenn Highway & National

Table 11: Colonel Glenn Highway & National 2025 Peak Hour Traffic Analysis (Signalized)

Int #1	2025 AM No Build						Int #1	2025 AM Build				
Colonel Glenn & National	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	Colonel Glenn & National	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	185	B	18	0.26	0.63	89	EBL	C	27	0.73	1.13	219
EBT	320	C	23.4	0.33	0.58	162	EBT	C	25.3	0.35	1.0	218
EBR	259	B	16.4	0.36	0.8	179	EBR	B	18.1	0.38	0.71	159
EB App	-	C	20.2	-	-	-	EB App	C	23.9	-	-	-
WBL	235	B	18.3	0.35	0.57	113	WBL	C	24.3	0.36	0.72	115
WBT	440	C	24.2	0.35	0.49	187	WBT	D	35.9	0.53	0.69	265
WBR	440	C	24.5	0.36	0.49	187	WBR	D	36.7	0.55	0.69	265
WB App	-	C	23	-	-	-	WB App	C	33.7	-	-	-
NBL	475	E	69.2	0.92	0.59	267	NBL	E	69.2	0.92	0.65	298
NBT	625	D	49.5	0.87	0.6	385	NBT	D	52.9	0.89	0.54	324
NBR	625	D	49.9	0.87	0.56	336	NBR	D	53	0.89	0.47	287
NB App	-	E	56.3	-	-	-	NB App	E	58.1	-	-	-
SBL	330	C	33	0.37	0.22	57	SBL	C	32.4	0.42	0.24	67
SBT	1500	D	38.6	0.48	0.09	100	SBT	D	37.7	0.51	0.1	118
SBR	570	D	39.1	0.51	0.27	138	SBR	D	38.3	0.54	0.34	184
SB App	-	D	37.8	-	-	-	SB App	D	37	-	-	-
Int	-	D	37.4	-	-	-	Int	D	40.2	-	-	-
Int #1		2025 PM No Build					Int #1	2025 PM Build				
Colonel Glenn & National	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	Colonel Glenn & National	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	185	C	30.4	0.48	1.13	149	EBL	D	45.3	0.72	1.13	217
EBT	320	D	39.9	0.57	1.28	279	EBT	D	51.7	0.75	1.01	336
EBR	259	C	30.5	0.62	1.08	297	EBR	D	41.3	0.74	1.58	306
EB App		D	35.2	-	-	-	EB App	D	47	-	-	-
WBL	235	D	40.1	0.77	1.10	280	WBL	E	56.2	0.86	1.21	297
WBT	440	D	41.3	0.63	0.83	325	WBT	E	62.4	0.84	1.19	399
WBR	440	D	41.3	0.63	0.83	312	WBR	E	62.5	0.84	1.17	383
WB App		D	41	-	-	-	WB App	E	60.9	-	-	-
NBL	475	E	75.2	0.93	0.87	549	NBL	E	75.2	0.93	0.87	506
NBT	625	C	34.2	0.48	0.63	504	NBT	C	29.3	0.42	0.62	428
NBR	625	C	34.5	0.49	0.62	330	NBR	C	29.5	0.43	0.62	373
NB App		D	54.3	-	-	-	NB App	D	51.5	-	-	-
SBL	330	C	30.4	0.46	0.62	138	SBL	C	24.9	0.49	1.07	376
SBT	1500	E	55.4	0.86	0.22	285	SBT	E	66.4	0.95	0.58	895
SBR	570	E	55.7	0.87	0.56	345	SBR	E	67.6	0.95	1.01	647
SB App	-	D	50.9	-	-	-	SB App	E	59.5	-	-	-
Int	-	D	45.0	-	-	-	Int	D	54.6	-	-	-

The results of the 2025 capacity analysis at Colonel Glenn & National indicate:

- 2025 AM Peak hour – Comparison of No Build to Build conditions show intersection LOS is unchanged.
- 2025 PM Peak hour - Comparison of No Build to Build conditions show intersection LOS is unchanged.

The eastbound and westbound storage lengths are limited by the presence of nearby intersections and during the max queue, may back up to and through the adjacent signal.

B. National & Reese/WPAFB Gate 19B

Table 12: National & Reese/WPAFB Gate 19B 2025 Peak Hour Traffic Analysis (Signalized)

Int #2		2025 AM No Build					Int #2	2025 AM Build				
National & Reese/Base Gate	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Reese/Base Gate	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	285	C	25.6	0.39	0.58	121	EBL	C	25.6	0.39	0.38	94
EBT	650	C	20.2	0.02	0.05	21	EBT	C	20.2	0.02	0.05	19
EBR	255	A	8.2	0.15	0.35	71	EBR	A	8.2	0.15	0.33	68
EB App		B	15.5	-	-	-	EB App	B	15.5	-	-	-
WBL	200	C	29.3	0.14	0.42	94	WBL	C	30.9	0.29	0.42	107
WBT	500	A	0	0	1.07	601	WBT	A	0	0	1.25	709
WBR	500	D	51.2	0.87	1.07	601	WBR	D	50.8	0.87	1.25	709
WB App		D	48.5	-	-	-	WB App	D	46.1	-	-	-
NBL	585	C	30.5	0.90	1.04	694	NBL	D	42.4	0.96	1.04	754
NBT	1000	B	12.8	0.22	0.92	1164	NBT	B	13.0	0.24	0.92	1266
NBR	1000	B	11	0.01	0.02	12	NBR	B	11.1	0.02	0.03	21
NB App		C	26	-	-	-	NB App	C	34.3	-	-	-
SBL	185	C	23.5	0.03	0.21	27	SBL	C	23.6	0.03	0.57	53
SBT	1500	C	27.5	0.26	2.33	4028	SBT	C	31.3	0.48	2.33	4189
SBR	580	F	189.2	1.33	1.04	646	SBR	F	189.9	1.33	1.04	610
SB App		F	163.1	-	-	-	SB App	F	149.3	-	-	-
Int		E	77.3	-	-	-	Int	E	77.2	-	-	-
Int #2		2025 PM No Build					Int #2	2025 PM Build				
National & Reese/Base Gate	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Reese/Base Gate	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	285	E	67.9	0.98	1.09	356	EBL	E	67.9	0.98	1.09	361
EBT	650	C	23.3	0.16	1.13	971	EBT	C	23.3	0.16	1.09	786
EBR	255	C	30.8	0.75	1.1	299	EBR	C	30.8	0.75	1.09	284
EB App		D	48.3	-	-	-	EB App	D	48.3	-	-	-
WBL	200	D	47	0.18	0.32	51	WBL	D	47.8	0.24	0.35	61
WBT	500	A	0	0	0.13	62	WBT	A	0	0	0.17	63
WBR	500	D	46.8	0.24	0.13	62	WBR	D	46.8	0.24	0.17	63
WB App		D	46.9	-	-	-	WB App	D	47.3	-	-	-
NBL	585	B	16.1	0.09	0.09	40	NBL	B	16.3	0.09	0.09	43
NBT	1000	C	28	0.67	0.43	348	NBT	C	32.7	0.78	0.42	349
NBR	1000	B	17.5	0.08	0.2	123	NBR	B	18.2	0.15	0.2	196
NB App		C	26.5	-	-	-	NB App	C	30.1	-	-	-
SBL	185	B	17.7	0.15	1.13	114	SBL	B	19.7	0.18	0.91	80
SBT	1500	C	23.5	0.53	0.23	331	SBT	C	24	0.55	0.19	260
SBR	580	A	5.5	0.05	0.15	48	SBR	A	5.5	0.05	0.1	36
SB App		C	21.2	-	-	-	SB App	C	21.8	-	-	-
Int		D	36.2	-	-	-	Int	D	36.9	-	-	-

The results of the 2025 capacity analysis at National & Reese/WPAFB Gate 19B indicate:

- 2025 AM Peak hour – Comparison of No Build to Build conditions show intersection LOS is unchanged. Lengthy queues are noted in the model for the NBL and SBR movements into WPAFB.

- 2025 PM Peak hour - Comparison of No Build to Build conditions show intersection LOS is unchanged.

SimTraffic model queues for the northbound left and southbound right movements into WPAFB in the 2025 AM Peak hour are shown to extend outside of available bays as noted in the queues shown for the adjacent through movements. To remedy this deficiency present in both the No Build and Build conditions, dual northbound left and dual southbound right turn lanes were evaluated for the intersection. Capacity analysis results for the 2025 AM and PM Build conditions with the addition of the dual NBL and SBR bays are shown below.

Table 13: National & Reese/WPAFB Gate 19B 2025 Peak Hour w/Imp Traffic Analysis (Signalized)

Int #2		2025 AM Build w/ Improvements					Int #2	2025 PM Build w/ Improvements				
National & Reese/Base Gate	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Reese/Base Gate	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	285	C	22.8	0.36	0.31	75	EBL	E	67.9	0.98	1.09	357
EBT	650	B	17.8	0.02	0.04	14	EBT	C	23.3	0.16	1.09	779
EBR	255	A	9	0.16	0.34	62	EBR	C	30.8	0.75	1.1	283
EB App		B	14.7	-	-	-	EB App	D	48.3	-	-	-
WBL	200	C	28.1	0.28	0.42	105	WBL	D	47.8	0.24	0.33	61
WBT	500	A	0.0	0.0	1.12	516	WBT	A	0	0	0.16	53
WBR	500	D	43.6	0.85	1.12	516	WBR	D	46.8	0.24	0.16	53
WB App		D	40	-	-	-	WB App	D	47.3	-	-	-
NBL	585	C	34.0	0.83	0.41	227	NBL	B	16	0.05	0.09	34
NBT	1000	B	13.5	0.25	0.15	124	NBT	C	32.7	0.78	0.41	475
NBR	1000	B	11.4	0.02	0.04	21	NBR	B	18.2	0.15	0.17	170
NB App		C	28.3	-	-	-	NB App	C	30.1	-	-	-
SBL	185	C	20.4	0.02	0.13	21	SBL	B	19.7	0.18	0.88	99
SBT	1500	C	26.9	0.44	0.14	168	SBT	C	24	0.55	0.25	273
SBR	580	C	26.5	0.70	0.37	193	SBR	A	5.3	0.03	0.04	26
SB App		C	26.5	-	-	-	SB App	C	21.8	-	-	-
Int		C	28.2	-	-	-	Int	D	36.9	-	-	-

Capacity analysis and queue results with the addition of the dual northbound left and dual southbound right turn bays yields acceptable results for the intersection of National & Reese/WPAFB Gate 19B. The eastbound QSR greater than 1.0 indicate that queues extend slightly outside of available bays on the Base property.

C. National & Kauffman

Table 14: National & Kauffman 2025 Peak Hour Traffic Analysis (Signalized)

Int #3	2025 AM No Build						Int #3	2025 AM Build				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	C	26.2	0.78	0.51	777	EBT	C	27.1	0.79	0.64	1128
EBR	1500	D	37.9	0.90	0.52	897	EBR	F	66.7	1.04	0.56	1098
EB App		C	32	-	-	-	EB App	D	48	-	-	-
WBL	110	B	15.7	0.24	0.84	80	WBL	B	17.2	0.29	1.17	98
WBT	1500	A	6.3	0.13	0.07	79	WBT	A	6.8	0.13	0.06	75
WB App		A	9.4	-	-	-	WB App	B	10.5	-	-	-
NBL	1500	D	48	0.87	0.19	248	NBL	D	49.8	0.88	0.17	222
NBR	185	C	31.5	0.15	1.14	115	NBR	C	31.2	0.15	1.12	118
NB App		D	45.8	-	-	-	NB App	D	47.3	-	-	-
Int		C	31.6	-	-	-	Int	D	43.4	-	-	-
Int #3	2025 PM No Build						Int #3	2025 PM Build				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	E	60	0.71	0.64	1268	EBT	F	110.1	1.01	0.64	1146
EBR	1500	F	157.9	1.17	0.65	1119	EBR	F	396.7	1.72	0.65	993
EB App		F	117	-	-	-	EB App	F	279.3	-	-	-
WBL	110	D	36.1	0.09	1.22	95	WBL	D	41.1	0.11	1.22	107
WBT	1500	D	37.1	0.48	0.22	292	WBT	D	43.1	0.58	0.23	335
WB App		D	37	-	-	-	WB App	D	43	-	-	-
NBL	1500	E	64.1	1.0	1.7	2814	NBL	D	45.3	0.97	0.71	1278
NBR	185	B	17.1	0.09	1.14	167	NBR	B	12.1	0.09	1.14	178
NB App		E	30.6	-	-	-	NB App	D	42.8	-	-	-
Int		E	77.7	-	-	-	Int	F	128	-	-	-

The results of the 2025 capacity analysis at National & Kauffman indicate:

- 2025 AM Peak hour – Comparison of No Build to Build conditions show degradation of the eastbound right movement and overall intersection LOS drops from a C to a D. Lengthy queues are noted for the eastbound approach.
- 2025 PM Peak hour - Comparison of No Build to Build conditions show degradation of the eastbound approach and overall intersection LOS drops from an E to an F. Lengthy queues are noted for the eastbound approach and northbound left movement. Additionally, the northbound left movement is approaching capacity.

To address the degradation as well as failing movements in both the No Build and Build conditions at this intersection, an eastbound right overlap phase (to run with the northbound left movement) was evaluated. Capacity analysis results for the 2025 AM and PM No Build and Build conditions with the addition of the eastbound right turn overlap are shown in the following table.

Table 15: National & Kauffman 2025 Peak Hour w/Improvements Traffic Analysis (Signalized)

Int #3	2025 AM No Build with EBR Overlap						Int #3	2025 AM Build with EBR Overlap				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	C	26.2	0.78	0.42	572	EBT	C	24.1	0.75	0.27	338
EBR	1500	B	11.8	0.65	0.33	447	EBR	B	12.4	0.71	0.17	200
EB App		B	19.1	-	-	-	EB App	B	17.9	-	-	-
WBL	110	B	15.7	0.24	0.89	83	WBL	B	17.2	0.31	0.95	81
WBT	1500	A	6.3	0.13	0.82	85	WBT	A	6.8	0.13	0.07	88
WB App		A	9.4	-	-	-	WB App	B	10.5	-	-	-
NBL	1500	D	48	0.87	0.16	220	NBL	D	49.8	0.88	0.17	239
NBR	185	C	31.5	0.15	0.94	107	NBR	C	31.2	0.15	0.48	62
NB App		D	45.8	-	-	-	NB App	D	47.3	-	-	-
Int		C	22.5	-	-	-	Int	C	22	-	-	-
Int #3	2025 PM No Build with EBR Overlap						Int #3	2025 PM Build with EBR Overlap				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	E	67	0.86	0.34	514	EBT	E	72.6	0.87	0.29	401
EBR	1500	A	5.6	0.39	0.1	120	EBR	A	5.2	0.39	0.08	124
EB App		C	31.2	-	-	-	EB App	C	32.8	-	-	-
WBL	110	C	33.9	0.11	1.22	96	WBL	D	38.1	0.12	1.22	78
WBT	1500	C	34.6	0.55	0.22	298	WBT	D	39.2	0.57	0.2	271
WB App		C	34.6	-	-	-	WB App	D	39.1	-	-	-
NBL	1500	D	41.8	0.96	0.51	705	NBL	D	53.7	0.99	0.78	1197
NBR	185	B	12.4	0.09	1.14	202	NBR	B	12.1	0.09	1.14	194
NB App		D	39.7	-	-	-	NB App	D	50.6	-	-	-
Int		D	35.8	-	-	-	Int	D	42.5	-	-	-

The addition of the eastbound right overlap phase improves overall performance of the intersection. Capacity analysis results with the addition of the eastbound right overlap yields acceptable results for the intersection of National & Kauffman.

D. National & North Access

Capacity and signal warrant analysis results presented in Section 6.1 indicate additional improvements are necessary for the main access of the proposed development. The capacity analysis results presented below include a northbound left turn bay and separate left and right lanes for the eastbound approach exiting the development. Additionally, all left turning traffic was moved to this intersection as the south access is projected to be limited to right-in/right-out only.

Table 16: National & North Access 2025 Peak Hour Traffic Analysis (Signalized)

Int #4	2025 AM Build w/ Imp						Int #4	2025 PM Build w/ Imp				
National & North Access	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	200	D	49.5	0.33	0.33	55	EBL	D	35.7	0.51	0.8	128
EBR	200	D	53.6	0.52	0.31	50	EBR	D	42.1	0.8	0.75	144
EB App		D	51.9	-	-	-	EB App	D	39.4	-	-	-
NBL	500	A	5.5	0.5	0.43	175	NBL	B	17.6	0.18	0.48	74
NBT	1500	A	3.2	0.58	0.14	122	NBT	A	6.5	0.48	0.15	200
NB App		A	3.8	-	-	-	NB App	A	7.5	-	-	-
SBT	1500	A	0	0	0.07	67	SBT	A	0	0	0.23	324
SBR	1500	A	1.8	0.36	0.07	67	SBR	B	10.5	0.72	0.23	324
SB App		A	1.8	-	-	-	SB App	B	10.5	-	-	-
Int		A	4.6	-	-	-	Int	B	14.1	-	-	-

Capacity analysis results indicate that a traffic signal will operate acceptably at the proposed north access in the 2025 AM and PM peak hours during the build conditions.

E. National & South Access

This access is projected to be limited to right-in/right-out only with additional movements provided at the signalized North Access.

Table 17: National & South Access 2025 Peak Hour Traffic Analysis (Unsignalized)

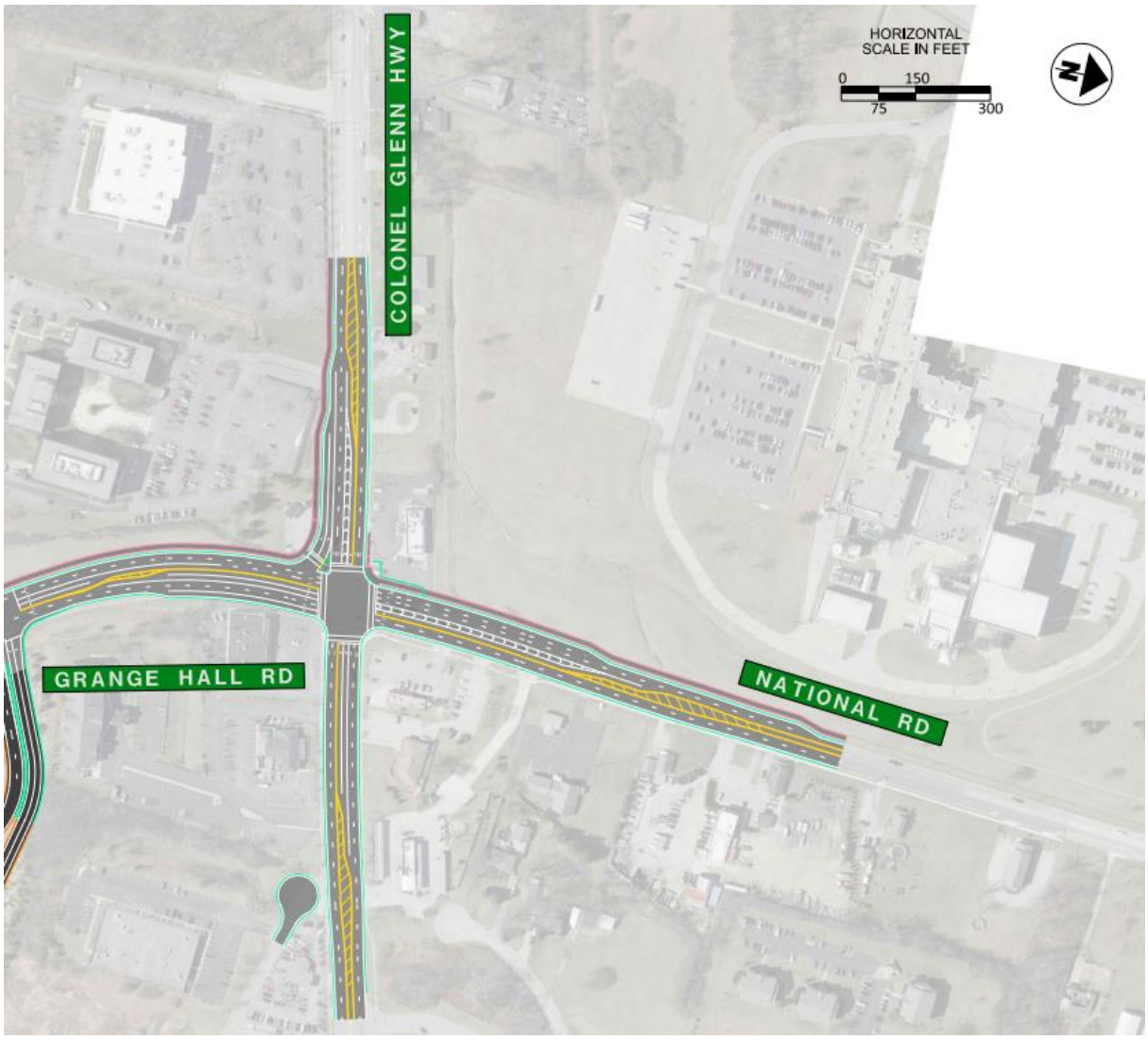
Int #4	2025 AM Build						Int #4	2025 PM Build				
National & South Access	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & South Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EB	200	B	11.3	0.04	0.2	40	EB	D	32.8	0.5	0.56	90

Capacity analysis results indicate acceptable operations at the proposed south access in the 2025 AM and PM peak hours during the build conditions.

6.3 2045 Design Year Traffic Analysis

The 2045 Design Year Traffic Analysis assumes improvements related to the ongoing I-675 & Colonel Glenn Interchange Study will be in place. The traffic volumes related to the proposed Hilltop Parcel development were added to the Build traffic plates from the ongoing IMS to estimate traffic volumes for the design year. At present, several interchange scenarios are being evaluated but in all cases, the improvements necessary at Colonel Glenn & National Road are the same. The geometry shown in *Figure 2* below is assumed to be in place by the 2045 Design Year.

Figure 2: Proposed Improvements at Colonel Glenn & National



In addition to the improvements identified as part of the IMS for ODOT, the City of Beavercreek will also be looking at an analysis of the larger local roadway network that might be impacted by the interchange improvements, which would include looking at the entire length of National Road between Col. Glenn Highway and Kauffman Ave. Based on verbal discussions the developer had with Jeff Moorman (City of Beavercreek) on 6/6/2024, the City anticipates a 5-lane section on National Road will likely be needed by the design horizon. For this analysis, a 5-lane section on National Road was assumed to stretch from the interchange related improvements at the Colonel Glenn & National intersection to Reese/WPAFB Gate 19B.

A. Colonel Glenn Highway & National

Table 18: Colonel Glenn Highway & National 2045 Peak Hour Traffic Analysis (Signalized)

Int #1	2045 AM No Build						Int #1	2045 AM Build				
Colonel Glenn & National	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	Colonel Glenn & National	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	185	C	24.8	0.07	0.42	41	EBL	C	28.3	0.08	0.23	30
EBT	320	C	30.1	0.24	0.57	158	EBT	C	34.2	0.28	0.5	157
EBR	415	B	19.4	0.22	0.4	143	EBR	C	22.7	0.24	0.32	138
EB App	-	C	24.7	-	-	-	EB App	C	28.4	-	-	-
WBL	485	E	63.9	0.85	0.48	203	WBL	E	63.9	0.85	0.59	242
WBT	1000	C	23.7	0.21	0.15	131	WBT	C	28.1	0.28	0.2	170
WBR	1000	C	24	0.22	0.15	131	WBR	C	38.6	0.3	0.2	170
WB App	-	D	45.5	-	-	-	WB App	D	46.2	-	-	-
NBL	535	E	58.4	0.85	0.58	262	NBL	E	58.4	0.85	0.94	480
NBT	625	D	44	0.84	0.70	369	NBT	E	61.5	0.99	1.14	724
NBR	625	C	29.4	0.66	0.5	261	NBR	C	24.9	0.60	0.59	342
NB App	-	D	43.7	-	-	-	NB App	D	53.1	-	-	-
SBL	560	D	36.5	0.41	0.2	80	SBL	D	36.1	0.52	0.19	81
SBT	1500	D	39.6	0.31	0.08	102	SBT	D	35.6	0.29	0.09	111
SBR	630	D	40	0.32	0.21	124	SBR	D	35.9	0.3	0.2	111
SB App	-	D	39.1	-	-	-	SB App	D	35.8	-	-	-
Int	-	D	40.2	-	-	-	Int	D	45.9	-	-	-
Int #1		2045 PM No Build					Int #1	2045 PM Build				
Colonel Glenn & National	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	Colonel Glenn & National	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	185	D	36.7	0.17	0.31	46	EBL	D	39.6	0.18	0.35	48
EBT	320	D	47.2	0.52	0.77	194	EBT	D	52.2	0.6	0.71	202
EBR	415	C	33.8	0.5	0.61	228	EBR	D	37.3	0.55	0.59	207
EB App	-	D	39.4	-	-	-	EB App	D	43.4	-	-	-
WBL	485	E	76.8	0.98	0.87	445	WBL	E	76.8	0.98	0.87	484
WBT	1000	C	30.8	0.39	0.7	524	WBT	C	34.1	0.43	0.89	929
WBR	1000	C	30.9	0.39	0.7	395	WBR	C	35.6	0.43	0.89	771
WB App	-	E	58.0	-	-	-	WB App	E	59.2	-	-	-
NBL	535	E	75.4	0.93	0.71	392	NBL	E	75.4	0.93	0.87	426
NBT	625	C	34.1	0.39	0.56	234	NBT	C	33.3	0.41	0.53	240
NBR	625	C	27	0.75	0.67	326	NBR	C	25.1	0.73	0.65	341
NB App	-	D	44.2	-	-	-	NB App	D	42.5	-	-	-
SBL	560	C	32	0.51	0.29	140	SBL	C	30	0.6	0.37	185
SBT	1500	D	48.6	0.8	0.17	235	SBT	D	54.3	0.9	0.23	317
SBR	630	D	52.2	0.81	0.53	312	SBR	E	61.3	0.9	0.64	378
SB App	-	D	47.4	-	-	-	SB App	E	53	-	-	-
Int	-	D	47.6	-	-	-	Int	D	49.7	-	-	-

The results of the 2045 capacity analysis (with the proposed IMS related improvements) indicate acceptable operations for the site build conditions. The results meet Greene County's LOS, approach and movement goals. No additional improvements over those anticipated with the proposed interchange reconfiguration are recommended at this intersection for the 2045 Hilltop Build conditions.

B. National & Reese/WPAFB Gate 19B

The 2045 Design year conditions at this intersection were analyzed to include the improvements identified in the 2025 horizon including northbound dual left and southbound dual right lanes for entering the WPAFB gate.

Table 19: National & Reese/WPAFB Gate 19B 2045 Peak Hour Traffic Analysis (Signalized)

Int #2		2045 AM No Build					Int #2	2045 AM Build				
National & Reese/Base Gate	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Reese/Base Gate	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	285	C	24.5	0.38	0.41	105	EBL	C	24.5	0.38	0.44	93
EBT	650	B	18.1	0.01	0.05	19	EBT	B	18.1	0.01	0.04	17
EBR	255	A	8.8	0.15	0.4	82	EBR	A	8.8	0.15	0.31	66
EB App		B	15.2	-	-	-	EB App	B	15.2	-	-	-
WBL	200	C	27.5	0.22	0.42	100	WBL	C	29	0.34	0.42	105
WBT	500	A	0	0	1.12	506	WBT	A	0	0.0	1.09	623
WBR	500	D	40	0.86	1.12	506	WBR	D	39.7	0.85	1.09	623
WB App		D	37.8	-	-	-	WB App	D	37	-	-	-
NBL	585	D	41.6	0.85	0.53	296	NBL	D	41.7	0.85	0.5	269
NBT	1000	B	18.5	0.3	0.2	176	NBT	B	18.8	0.32	0.22	193
NBR	1000	B	15.6	0.03	0.04	19	NBR	B	15.7	0.04	0.06	37
NB App		C	34.6	-	-	-	NB App	C	34.4	-	-	-
SBL	185	C	24.3	0.05	0.32	42	SBL	C	24.4	0.05	0.84	71
SBT	1500	C	30.8	0.35	0.13	183	SBT	D	35.4	0.56	0.2	253
SBR	580	C	33.4	0.73	0.45	228	SBR	C	33.6	0.73	0.41	222
SB App		C	32.7	-	-	-	SB App	C	33.9	-	-	-
Int		C	32.7	-	-	-	Int	C	33	-	-	-
Int #2		2045 PM No Build					Int #2	2045 PM Build				
National & Reese/Base Gate	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Reese/Base Gate	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	285	E	67.7	0.99	1.09	345	EBL	E	74.7	1.00	1.09	333
EBT	650	C	21.9	0.22	1.11	885	EBT	C	26.1	0.22	1.11	886
EBR	255	C	28.3	0.73	1.1	294	EBR	D	35.1	0.74	1.09	289
EB App		D	46.4	-	-	-	EB App	D	52.9	-	-	-
WBL	200	D	49.2	0.29	0.42	67	WBL	E	61.2	0.42	0.42	87
WBT	500	A	0	0	0.21	82	WBT	A	0	0	0.38	140
WBR	500	D	48.7	0.37	0.21	82	WBR	E	59.3	0.44	0.38	140
WB App		D	48.9	-	-	-	WB App	E	60.2	-	-	-
NBL	585	D	52	0.24	0.29	91	NBL	E	61.5	0.26	0.52	307
NBT	1000	D	42.1	0.86	0.54	500	NBT	D	49.7	0.91	0.74	798
NBR	1000	C	21.2	0.16	0.25	143	NBR	C	23.1	0.21	0.47	342
NB App		D	39.9	-	-	-	NB App	D	46	-	-	-
SBL	185	C	23.9	0.36	1.13	175	SBL	C	29.7	0.45	1.13	146
SBT	1500	C	29.7	0.66	0.23	319	SBT	C	31.1	0.64	0.28	377
SBR	580	A	5.3	0.03	0.06	26	SBR	A	4.6	0.03	0.04	19
SB App		C	26.9	-	-	-	SB App	C	28.8	-	-	-
Int		D	40.1	-	-	-	Int	D	45.5	-	-	-

The results of the 2045 capacity analysis at National & Reese/WPAFB Gate 19B indicate:

- The proposed 2025 improvements allow the intersection to function acceptably during the 2045 Design horizon. Although slight increases in movement delays are noted, the intersection continues to meet Greene County's LOS, approach and movement goals.

No additional improvements over those identified in the 2025 horizon are recommended at this intersection for the 2045 Hilltop Build conditions.

C. National & Kauffman

The 2045 Design year conditions at this intersection were analyzed to include the improvements identified in the 2025 horizon including eastbound right overlap phasing.

Table 20: National & Kauffman 2045 Peak Hour Traffic Analysis (Signalized)

Int #3	2045 AM No Build						Int #3	2045 AM Build				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	D	44.7	0.97	0.45	699	EBT	D	47.7	0.98	0.57	869
EBR	1500	B	11	0.68	0.29	514	EBR	B	13.5	0.77	0.44	547
EB App		C	29.2	-	-	-	EB App	C	21.1	-	-	-
WBL	110	C	23.4	0.5	1.15	106	WBL	C	24.8	0.57	1.15	100
WBT	1500	A	7.5	0.18	0.09	101	WBT	A	7.8	0.18	0.1	119
WB App		B	12.7	-	-	-	WB App	B	13.8	-	-	-
NBL	1500	D	54.8	0.9	0.22	279	NBL	E	56.6	0.9	0.2	284
NBR	185	C	31.4	0.17	0.39	57	NBR	C	31.2	0.17	0.5	72
NB App		D	51.4	-	-	-	NB App	D	53	-	-	-
Int		C	30.6				Int	C	32.3			
Int #3	2045 PM No Build						Int #3	2045 PM Build				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	F	95.2	0.98	0.48	823	EBT	F	96.1	0.99	0.44	593
EBR	1500	A	4	0.4	0.26	589	EBR	A	4.1	0.41	0.22	186
EB App		D	45.5	-	-	-	EB App	D	45.3	-	-	-
WBL	110	D	45	0.21	0.97	79	WBL	D	45.1	0.22	1.03	82
WBT	1500	E	56.1	0.76	0.28	406	WBT	E	56.1	0.76	0.28	412
WB App		E	55.6	-	-	-	WB App	E	55.6	-	-	-
NBL	1500	F	67.2	1.03	2.09	3446	NBL	F	92.6	1.11	2.32	4225
NBR	185	B	13.1	0.09	1.14	190	NBR	B	13.2	0.1	1.14	209
NB App		E	63.2	-	-	-	NB App	F	86.6	-	-	-
Int		E	55.2	-	-	-	Int	E	66.3	-	-	-

The addition of the eastbound right overlap phase improves overall performance of the intersection for the 2025 conditions, but by the 2045 design horizon the PM peak hour indicates a LOS F for the eastbound through and northbound left movements in both the No Build and Build conditions. In order to remedy these issues, the northbound left movement requires dual left turn lanes. This necessitates widening of

Kauffman west of the intersection to accept two lanes of turning vehicles. Kauffman is 4 lanes wide approaching SR 444 so the widening required from National Road to meet the existing 4 lane section is approximately 1,700 ft.

Capacity analysis results for the 2045 conditions with the addition of the northbound dual left and eastbound right turn overlap are shown in the following table.

Table 21: National & Kauffman 2045 Peak Hour w/Improvements Traffic Analysis (Signalized)

Int #3	2045 AM No Build with dual NBL						Int #3	2045 AM Build with dual NBL				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	C	26.7	0.88	0.47	547	EBT	C	27.7	0.88	0.51	664
EBR	1500	B	12.2	0.71	0.16	192	EBR	B	15.5	0.8	0.36	396
EB App		C	20.1	-	-	-	EB App	C	21.7	-	-	-
WBL	110	B	19	0.41	1.01	86	WBL	B	19.9	0.46	1.08	103
WBT	1500	A	4.7	0.17	0.08	103	WBT	A	4.9	0.17	0.09	107
WB App		A	9.4	-	-	-	WB App	B	10.1	-	-	-
NBL	1500	D	39.2	0.75	0.11	152	NBL	D	39.2	0.76	0.11	157
NBR	185	D	35	0.27	0.42	59	NBR	C	34.8	0.27	0.49	71
NB App		D	38.6	-	-	-	NB App	D	38.6	-	-	-
Int		C	21.6	-	-	-	Int	C	22.9	-	-	-
Int #3	2045 PM No Build with dual NBL						Int #3	2045 PM Build with dual NBL				
National & Kauffman	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & Kauffman	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1500	C	26.5	0.56	0.24	300	EBT	C	28.8	0.58	0.25	299
EBR	1500	A	5.1	0.43	0.08	97	EBR	A	5.1	0.44	0.08	100
EB App		B	14.8	-	-	-	EB App	B	15.7	-	-	-
WBL	110	B	17.6	0.08	0.97	84	WBL	B	19.2	0.09	0.96	74
WBT	1500	B	18.9	0.46	0.2	271	WBT	C	20.7	0.47	0.2	264
WB App		B	18.8	-	-	-	WB App	C	20.6	-	-	-
NBL	1500	D	38.3	0.89	0.33	425	NBL	D	40	0.9	0.43	545
NBR	185	C	24	0.16	1.14	256	NBR	C	23.3	0.16	1.14	260
NB App		D	37.3	-	-	-	NB App	D	38.7	-	-	-
Int		C	25.7	-	-	-	Int	C	27.3	-	-	-

Capacity analysis results with the addition of the dual northbound left as well as the eastbound right overlap yields acceptable results for the 2045 No Build and Build conditions at the intersection of National & Kauffman.

D. National & North Access

The 2045 Design year conditions at this intersection were analyzed to include the signalization of the proposed north access as identified in the 2025 horizon as well as widening for a 5-lane section (as indicated by discussions with the City of Beavercreek).

Table 22: National & North Access 2045 Peak Hour Traffic Analysis (Signalized)

Int #4	2045 AM Build						Int #4	2045 PM Build				
National & North Access	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & North Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	200	D	35.1	0.15	0.37	56	EBL	D	48.1	0.56	0.96	155
EBR	200	D	35.8	0.23	0.35	49	EBR	D	44.8	0.64	0.63	113
EB App		D	35.5	-	-	-	EB App	D	46.2	-	-	-
NBL	515	A	5.1	0.52	0.42	158	NBL	A	6.7	0.16	0.17	62
NBT	600	A	3.7	0.4	0.39	183	NBT	A	4	0.21	0.35	155
NB App		A	4	-	-	-	NB App	A	4.2	-	-	-
SBT	900	A	8.3	0.29	0.19	139	SBT	B	11.1	0.52	0.24	192
SBR	700	A	8.4	0.29	0.29	139	SBR	B	11.1	0.52	0.31	192
SB App		A	8.4	-	-	-	SB App	B	11.1	-	-	-
Int		A	6.1	-	-	-	Int	B	14.1	-	-	-

Capacity analysis results indicate acceptable operations at the North Access for the 2045 Hilltop Build conditions.

E. National & South Access

This access is projected to be limited to right-in/right-out only with additional movements provided at the signalized North Access.

Table 23: National & South Access 2045 Peak Hour Traffic Analysis (Unsignalized)

Int #4	2045 AM Build w/ Imp						Int #4	2045 PM Build w/ Imp				
National & South Access	Storage	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)	National & South Access	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBR	200	B	10.0	0.03	0.16	40	EBR	C	19.6	0.34	0.59	94

Capacity analysis results indicate acceptable operations at the South Access for the 2045 Hilltop Build conditions.

7.0 Roadway Network Conclusions

The roadway and intersection modifications that are recommended based on the analysis presented in this study include:

7.1 Proposed Development Accesses

The analysis completed in this study justifies one full movement signalized access and one right-in/right-out access for the proposed development.

National Road & North Access

As shown on the current site plan, this access represents the "main" access for the proposed development, located approximately 1,000' south of Reese/WPAFB Gate 19B. Traffic signal warrant analysis indicates a traffic signal will likely meet ODOT warrants for opening day of this development. The Greene County Engineer requires that traffic signals be spaced approximately ¼ mile (1,320') from adjacent traffic signals. The traffic signal and roadway improvements should be constructed to accommodate the anticipated future widening of National Road. These improvements should be constructed for Opening Day of the proposed development.

1. **Northbound Approach:** Construct a northbound left turn lane of 515' (including 50' taper). Provide protected-permitted left turn phasing.
2. **Eastbound Approach (Site Driveway):** Provide separate left and right exit lanes with a minimum storage of 200' each and a minimum of one site entry lane. Provide right turn overlap phasing for eastbound right lane.
3. **Maximize the distance between the proposed signalized development access and the traffic signal at Reese/WPAFB Gate 19B.**

National Road & South Access

This access is proposed to be limited to right-in/right-out operation. These improvements should be constructed for Opening Day of the proposed development.

1. **Eastbound Approach (Site Driveway):** Provide a single right turn exit lane with a minimum storage of 200' and a minimum of one site entry lane. Construct the south access as to prohibit left turns into or out of the development at this location.

7.2 Public Roadway Intersections

Colonel Glenn & National

The results of the capacity analysis at the intersection of Colonel Glenn & National indicate the existing intersection geometry can accommodate traffic volumes related to 2025 Opening Day of the proposed development. Based on the initial recommendations being developed as part of the Colonel Glenn interchange IMS, widening will be needed on the southbound approach to provide a third through/right lane. In the 2045 Design Year analysis with construction of the proposed interchange improvements, the geometry currently being considered in the IMS can accommodate the build traffic volumes for the proposed site.

National & Reese/WPAFB Gate 19B

Utilizing the certified traffic volumes from the I-675 & Grange Hall Interchange Study, the results of the capacity analysis at the intersection of National & Reese/WPAFB Gate 19B indicate additional capacity

and queue storage is needed for the northbound left and southbound right movements entering the Base gate in the AM peak hour in the no build conditions, whether or not the proposed development is built. The intersection should be widened to allow for a northbound dual left turn movement and a southbound dual right turn movement. ODOT storage lane calculations indicate a total storage requirement of 940' (over two lanes) for the northbound left and 940' for the southbound right. *SimTraffic* results indicate 95th percentile queues (per lane) for the northbound left of 307' and for the southbound right (per lane) of 228'. The widening of the northbound approach should accommodate two left turn lanes with a total of 940' storage per ODOT requirements and the widening of the southbound approach should accommodate dual right turn lanes with a total of 940' storage per ODOT requirements. Additional consideration may be necessary within the Base to allow for queuing of these vehicles for processing during the peak entering times. Analysis results for the 2025/2045 Build conditions indicate with the proposed NBL and SBR improvements, no additional improvements are needed to accommodate the additional traffic volumes related to the proposed Hilltop development.

National & Kauffman

The results of the capacity analysis at the intersection of National & Kauffman indicate additional capacity for the northbound left and eastbound right movements will be required for Opening Day of the proposed development. The traffic signal should be modified to provide an eastbound right overlap phase to run with the northbound left turn phase. These traffic signal improvements should be constructed for Opening Day of the proposed development.

By the 2045 Design Horizon, additional improvements are needed at this intersection to accommodate both the No Build and Build traffic volumes. The northbound left movement requires dual left turn lanes. This necessitates widening of Kauffman west of the intersection to accept two lanes of turning vehicles. Kauffman is 4 lanes wide approaching SR 444 so the widening required from National Road to meet the existing 4 lane section is approximately 1,700 ft on Kauffman. ODOT storage lane calculations indicate a total storage requirement of 1415' (over two lanes) for the northbound left and 340' for the northbound right. *SimTraffic* results indicate 95th percentile queues (per lane) for the northbound left of 545' and for the northbound right of 260'. The widening of the northbound approach should accommodate a left turn lane of minimum 550' storage, with the northbound though lane serving as the second northbound left at the intersection. A northbound right turn lane of minimum 400' storage should also be provided. Construction of these capacity improvements should be planned for as future local roadway improvements are considered to accommodate background traffic growth in the area as well as impacts related to the I-675 interchange modification.

The Greene County Engineer's Office has indicated that a safety study is currently underway for the National & Kauffman intersection. As the safety study progresses to conclusions and implementation stages, it will be important to ensure that the improvements developed as a part of this traffic impact study do not negatively impact any safety-related improvements being considered for the future of this intersection.

8.0 Recommendations Summary

Table 24 summarizes the proposed improvements identified in this study and responsibility for each modification as described in Section 7.0 .

Table 24: Summary of Improvements

Intersection	Improvement	Responsibility	Year Required
National Road & North Development Access	Locate this intersection as to maximize distance between the proposed traffic signal and Reese/WPAFB Gate 19B intersection. The Greene County Engineer requires that traffic signals be spaced approximately ¼ mile (1,320') from adjacent traffic signals. Flip this access with the proposed right-in/right-out site access if necessary to maximize spacing of signalized intersections.	**Development**	**2025/OY**
	Construct a northbound left turn lane of 515' (including 50' taper). Construct a traffic signal. Provide protected-permitted left turn phasing.		**2025/OY**
	Provide separate left and right exit lanes with a minimum storage of 200' each and a minimum of one site entry lane. Provide right turn overlap phasing for eastbound right lane.		**2025/OY**
National Road & South Development Access	Provide a single right turn exit lane with a minimum storage of 200' and a minimum of one site entry lane. Construct the south access as to prohibit left turns into or out of the development at this location.	**Development**	**2025/OY**
Colonel Glenn & National Road	Capacity improvements are shown to be needed at this intersection by 2045 even before the proposed development traffic is added. Widen the southbound approach to provide a third through/right lane as proposed in the ongoing IMS related improvements.	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	2045/DY
National Road section from Colonel Glenn to Reese/WPAFB Gate 19B	Capacity improvements are shown to be needed in this section by 2045 even before the proposed development traffic is added. Widen to accommodate a 5-lane section on National Road stretching from the IMS related improvements at the Colonel Glenn & National intersection to Reese/WPAFB Gate 19B	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	2045/DY
National Road & Reese/WPAFB Gate 19B	With current WPAFB gate operations, capacity improvements are shown to be needed at this intersection by 2025 even before the proposed development traffic is added. Widen to allow for a northbound dual left turn movement and a southbound dual right turn movement into WPAFB Gate 19B. Additional consideration may be necessary within the Base to allow for queuing of these vehicles for processing during the peak entering times.	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	**2025/OY**
National Road & Kauffman Road	Modify the existing traffic signal equipment (existing roadway geometry to remain) to provide an eastbound right overlap phase to run with the northbound left turn phase. Ensure this improvement does not negatively impact any safety-related improvements currently being considered at this intersection.	**Development**	**2025/OY**
	Capacity improvements are shown to be needed at this intersection by 2045 even before the proposed development traffic is added. Widen the northbound approach for dual left dual left turn lanes and a right turn bay. The dual left necessitates widening of Kauffman west of the intersection to accept two lanes of turning vehicles. Ensure these improvements do not negatively impact any safety-related improvements being considered for the future of this intersection.	Non-Development – Improvement identified in No Build condition and will require a regional effort to fund improvements	2045/DY

OY = Opening Year of Development DY = Design Year (Opening Day + 20 Years)

MEMORANDUM

DATE: 8/21/2024

SUBJECT: Response to 8/21/24 Goodhue Consulting Comments on Hilltop Traffic Impact Study Submittal

PREPARED BY: Sara Senger, PE, PTOE – TEC Engineering, Inc.

PREPARED FOR: Project Review Team

TEC has received Goodhue's 8/21/24 comments on the August 12, 2024 Traffic Impact Study for the proposed Hilltop Development. TEC offers this formal response to comments in addition to a revised Traffic Impact Study addressing these comments.

1. **Appendix C figures do not show the south access as a right-in/right-out. Left turn volumes are shown into and out of the driveway. Please revise. The analysis appears to be correct.**
   The following sentence has been added to the report Section 7.1: The analysis completed in this study justifies one full movement signalized access and one right-in/right-out access for the proposed development.

2. **Section 7.1 where it states, "Greene County Engineer's Office prefers a ¼ mile (1.320') spacing between traffic signals." Revise to say, "The Greene County Engineer requires that traffic signals be spaced approximately ¼ mile (1,320') from adjacent traffic signals."**
   The reference sentence has been revised.

3. **Table 24 a. 1st improvement listed- This states that the RIRO access may be flipped with the signal if necessary for spacing of the signalized intersections however during the 8/8/24 meeting Greene County stated that the signalized intersection needed to be a minimum of ¼ mile from the Gate 19B and a RIRO could be placed between those two intersections.**
   The recommendations summary table has been revised.

4. **Table 24 b. Group the improvements by year and responsibility so that it is easier to know what improvements are needed prior to the development opening. This will help prioritize timing of improvements.**
   The recommendations summary has been revised to include a column for year required.

5. **Table 24 c. Identify who the Non-Development party is that is responsible. For example, Wright Patt Airforce Base, Greene County or ODOT.**
   The recommendations summary table has been revised.

6. **Table 24 d. Improvement wording for the National & Reese/WPAFB Gate 19B needs modified. It needs to state that with this development this intersection will only get worse and conditions will continue to break down and fail.**
   This comment will be addressed within the requirements outlined in the formal study approval letter.

Traffic Analysis

Gerlaugh Farms Site – Greene County, Ohio

Prepared By:

TEC Engineering, Inc.

Mason – Cincinnati – Dayton - Columbus

August 2024 – Version 1.1

Table of Contents

List of Appendix

Revision History

Date	Version	Description	Author
6/5/2024	1.0	Final Report	TEC
8/12/24	1.1	Revised Final Report to address comments	TEC

1.0 Introduction

TEC Engineering, Inc. was retained to conduct a Traffic Study for a proposed mixed-use development consisting of four buildings located off of Mission Point Blvd at Colonel Glenn Hwy, referred to as the "Gerlaugh Parcel".

Mission Point Blvd was previously evaluated in a 2008 Traffic Study completed by LJB. At the time of study, a large development including office, retail, and hotel uses was planned for the land located south of the proposed Gerlaugh Parcel. At present, one 90,000sf office building from the original plan is in operation, the remainder of the site continues to be undeveloped. A copy of this this traffic study is provided in ***Appendix A***.

The following sources were referenced:

- *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition*
- *State Highway Access Management Manual (SHAMM), February 2024 Edition*
- *ODOT Location and Design Manual, Volume One*

1.1 Study Area

The proposed development is located on land fronting Colonel Glenn Highway with proposed access to Mission Point Blvd. Colonel Glenn Highway, which runs east-west in this area, is categorized as a Principal Arterial Road and has an existing speed limit of 45mph. Mission Point Blvd, which runs north-south in this area, is categorized as a Local Road and has an existing speed limit of 25mph. The existing site is currently undeveloped.

The study limits include the adjacent roadway network and the following intersections:

- Colonel Glenn Highway & Mission Point Blvd
- Mission Point Blvd & Proposed Access

Figure 1: Study Area

1.2 Existing Volumes

Peak hour turning movement counts were recently collected at the intersection of Colonel Glenn Highway & Mission Point Blvd as part of the I-675 & Grange Hall Interchange Study. Traffic count data is provided in ***Appendix B***.

2.0 Proposed Site Development

The proposed development consists of four office buildings located off of Mission Point Blvd adjacent to Colonel Glenn Highway. Three are located east of Mission Point Blvd and a single building is proposed for the west side of Mission Point Blvd. A schematic of the development site plan is provided in ***Appendix C***.

3.0 Traffic Projections

3.1 Trip Generation

Total Trips

The development is proposed to contain office type land uses. The *Institute of Transportation Engineers (ITE) Trip Generation Manual* (11th Edition) is the most widely accepted publication for projecting traffic volumes; specifically related to how the site is used. The trips generated by the development were projected using the trip generation fitted curve equations provided in the Web-based Trip Generation App for Land Use Code 710: General Office Building, based on square footage of the proposed development. ***Table 1*** shows the total projected trips to be generated by the site during the average weekday AM and PM peak hours.

Table 1: Generated Trips

Land Use Type	Building(s)	Unit of Measure	Peak Hour Adjacent Street Traffic					
			Weekday AM			Weekday PM		
			Total	Enter	Exit	Total	Enter	Exit
Office	East of Mission Pt	gsf = 140,000	224	197	27	220	37	183
	West of Mission Pt	gsf = 20,000	42	37	5	44	7	37
		sum	266	234	32	264	44	220

3.2 Trip Distribution

Trip distribution in the original Mission Point study included 75% of development traffic to/from the east and 25% to/from the west at the intersection of Colonel Glenn Highway & Mission Point Blvd. This assumption continues to be valid and will be utilized for the Gerlaugh Parcel.

3.3 Background Traffic

A 20-year design horizon will be analyzed. Based on discussions with the development team, the analysis years will be an Opening Year of 2030 and a Design Year of 2050. TEC has received 2035/2055 No Build and Build traffic plates developed for use in the I-675 & Grange Hall Interchange Study. These plates are included in ***Appendix B.*** Since the interchange study years differ from the traffic impact study years, TEC calculated the yearly growth by comparing the volume difference between the 2023 and 2035 No Build traffic plates. Seven years of growth was added to the 2023 volumes to develop the 2030 No Build volumes. For the 2050 No Build volumes, TEC again calculated the yearly growth, this time by comparing the volume difference between the 2035 and 2055 No Build traffic plates and adding 15 years of traffic growth to the 2035 volume to develop the 2050 No Build volumes. From these calculations, the baseline through volumes for the Mission Point intersection were obtained for the study years.

Since the intersection of Mission Point Blvd & Colonel Glenn was constructed to serve a planned development that has not been fully built yet, the generated trips from the 2008 study for the worst case

development scenario (Phase 1 + 500K office) were added to the study year baseline through volumes at the intersection.

Combined, the study year baseline through volumes on Colonel Glenn plus the entering/exiting generated trips related to the original Mission Point development represent the theoretical "No Build" conditions for the Gerlaugh Parcel study.

3.4 Scenario Evaluation

To determine if there is additional capacity left at the intersection of Colonel Glenn Highway & Mission Point Blvd to accommodate the Gerlaugh Parcel development traffic, the following scenarios will be compared:

- Opening Year (2030) No Build – 2030 Background traffic + Mission Point Site Trips
- Opening Year (2030) Build – 2030 Background traffic + Mission Point Trips + Gerlaugh Trips
- Design Year (2050) No Build – 2050 Background traffic + Mission Point Site Trips
- Design Year (2050) Build – 2050 Background traffic + Mission Point Trips + Gerlaugh Trips

Volume diagrams for the analysis scenarios are provided in ***Appendix D***.

4.0 Sight Distance Analysis

An intersection sight distance (ISD) analysis was completed at the proposed access location on Mission Point. Based on the area conditions, a design speed of 30 mph (25mph speed limit +5) was assumed for Mission Point. Based on the assumed design speeds, the recommended minimum sight distances from the *ODOT Location & Design Manual, Volume I (201-5E, 201-1E)* and the field measured sight distances are shown in the following table.

Table 2: Intersection Sight Distances

Approach	Intersection Sight Distance (ODOT L&D Manual)		Field Measured Sight Distance (ft)	
	Movement	Mission Point Design Speed – 30 mph	Looking Left	Looking Right
East Development Access	Left Turn from Stop	335′	450′	175′+
	Right Turn from Stop	290′		
West Development Access	Left Turn from Stop	335′	175′+	450′
	Right Turn from Stop	290′		

+ Limited by distance to Colonel Glenn intersection. Full visibility of turns though the intersection of Mission Point & Colonel Glenn is present.

The sight distance was measured from a point 17.8’ feet from the existing edge of traveled way. The measured distances indicate that the intersection sight distance requirements are met for the proposed access locations.

5.0 Storage Lane Analysis

The ODOT Location & Design Manual, Volume One provides warrants to determine the need for separate turn lanes at unsignalized intersections. These warrants compare proposed traffic volumes and roadway speed characteristics to determine the need for storage lanes. Storage lane warrant analysis was performed for the uncontrolled movements impacted by development trips at the unsignalized intersection of Mission Point Blvd & the proposed access. The results of the warrant analysis have been summarized in ***Table 3*** below. The graphs associated with the intersection storage lane warrants have been included in ***Appendix E***.

Table 3: Turn Lane Warrant Summary

Intersection	Road/Direction	Movement	Year	Warranted?
Mission Point Blvd & Proposed Access	Mission Point Blvd	SBL	2030 Build	**YES**
			2050 Build	**YES**
		SBR	2030 Build	NO
			2050 Build	NO

The results of the storage lane analysis indicate that a dedicated southbound left turn bay is warranted at the proposed access on Mission Point Blvd in the Build condition.

The storage lengths for the warranted turn bay as well as the existing turn bays at the Mission Point Blvd & Colonel Glenn Highway were calculated using the procedures detailed in the *ODOT Location and Design Manual, Volume 1* (401-5bE,401-6bE). The storage lane lengths were calculated using a design speed of 50 mph for Colonel Glenn Highway and 30 mph for Mission Point Blvd (5 mph over posted speed limit). The storage length calculation has been summarized in the following table.

Table 4: Storage Lane Lengths (highest AM or PM Peak Hour)

Intersection	Movement	Existing Lengths*	ODOT Calculated Length*			
			2030 No Build	2030 Build	2050 No Build	2050 Build
Mission Point Blvd & Proposed Access	SBL	NA	-	225′	-	225′
Colonel Glenn Hwy & Mission Point Blvd	EBR	390′	520′ / 650′**	595′ / 650′**	520′ / 675′**	595′ / 675′**
	WBL	1030′ (over 2 lanes)	1120′	1270′	1120′	1270′

*Including 50’ taper

** ODOT calculated length / calculated length with backup

The calculated storage length for the southbound left bay at the proposed access on Mission Point is 225’ (including 50’ taper). For the existing storage bays at the intersection of Colonel Glenn Hwy & Mission Point Blvd, the available storage will be checked against 95th percentile queue in the following section.

6.0 Capacity Analysis

The software program, *Synchro*, was used to analyze capacity at the study intersections. *Synchro* uses the methods prescribed in the Highway Capacity Manual to determine the Level-of-Service (LOS). LOS is defined in terms of delay and is a measure of driver discomfort and intersection performance with respect to vehicular capacity and quality of service provided to road users. Delay refers to total average stopped delay experienced by motorists at the referenced intersection. Synchro was chosen as the appropriate software choice for the ability to model consecutive signalized and unsignalized intersections in one network as well as evaluate queuing through the network. *SimTraffic* outputs are utilized for 95th percentile queue. QSR was calculated by dividing *SimTraffic* Max Queue by available Storage. The level of service is classified into six different levels, ranging from A to F. ***Table 5*** shows the definitions of each level for unsignalized and signalized intersections, respectively:

Table 5: LOS Definitions

Level of Service	Signalized Delay	Stop Control Delay	Description
A	<10 seconds per vehicle	<10 seconds per vehicle	Very low delay
B	10-20 seconds per vehicle	10-15 seconds per vehicle	Good Progression
C	20-35 seconds per vehicle	15-25 seconds per vehicle	Limit of acceptable delay
D	35-55 seconds per vehicle	25-35 seconds per vehicle	Start of traffic breakdown
E	55-80 seconds per vehicle	35-50 seconds per vehicle	High delay
F	>80 seconds per vehicle	>50 seconds per vehicle	Congested conditions, unacceptable delay

The goal of the Greene County Engineer for the operation of all roadways is an overall level of service "D" or better during the peak traffic (design) hour of the roadway system. In areas where current levels-of-service is worse than 'D', the base level-of-service must be maintained or improved after development. The operational goals for capacity analysis are:

- Intersection LOS: D or better
- Approach LOS: D or better
- Movement LOS: E or better
- Volume to Capacity Ratio (V/C): All movements below 1.0, less than 0.93 preferred
- Queue Storage Ratio (QSR): All movements less than 1.0

As stated in the Greene County 'Developer Traffic Study Requirements', if the "Build" condition significantly degrades (by one letter if LOS is D or above) the intersection compared to the "No Build" condition, mitigations shall be required to return the level of service to "No Build" levels.

A summary of the traffic analysis has been included in the following tables. Capacity analysis worksheets have been included in ***Appendix F***. SimTraffic queueing worksheets have been included in ***Appendix G***.

Table 6: Colonel Glenn Highway & Mission Point Blvd 2030 Peak Hour Traffic Analysis (Signalized)

Int #1	2030 AM No Build (Signal, 110s)						Int #1	2030 AM Build (Signal, 110s)					
	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)		Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1000′	D	37.4	0.91	0.42	368	EBT	1000′	D	45.6	0.94	0.50	477
EBR	390′	C	25.2	0.57	0.74	233	EBR	390′	C	32.5	0.71	0.96	310
EB App	-	C	34.8	-	-	-	EB App	-	D	42.3	-	-	-
WBL	515′	D	39.1	0.90	0.68	335	WBL	515′	E	57	0.99	1.00	459
WBT	1200′	A	2.5	0.15	0.06	65	WBT	1200′	A	2.3	0.15	0.19	127
WB App	-	C	28.4	-	-	-	WB App	-	D	43	-	-	-
NBL	490′	D	43.0	0.34	0.18	75	NBL	490′	D	47.2	0.42	0.19	82
NBR	490′	B	16.9	0.15	0.18	91	NBR	490′	B	16.6	0.16	0.24	93
NB App	-	C	23.4	-	-	-	NB App	-	C	24.2	-	-	-
Int	-	C	31.1	-	-	-	Int	-	D	41.2	-	-	-
Int #1	2030 PM No Build (Signal, 110s)						Int #1	2030 PM Build (Signal, 110s)					
	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)		Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1000′	C	25.5	0.76	0.38	312	EBT	1000′	C	29.8	0.79	0.34	325
EBR	390′	B	20	0.19	0.28	91	EBR	390′	C	23.2	0.22	0.33	120
EB App	-	C	24.9	-	-	-	EB App	-	C	29.1	-	-	-
WBL	515′	D	35.8	0.71	0.38	180	WBL	515′	D	40.1	0.75	0.46	199
WBT	1200′	B	14.1	0.63	0.21	205	WBT	1200′	B	16.6	0.64	0.21	215
WB App	-	B	18.5	-	-	-	WB App	-	C	21.8	-	-	-
NBL	490′	C	20.8	0.50	0.21	99	NBL	490′	C	22.3	0.55	0.34	170
NBR	490′	B	18.1	0.72	0.24	122	NBR	490′	C	21.1	0.79	0.35	178
NB App	-	B	18.7	-	-	-	NB App	-	C	21.4	-	-	-
Int	-	C	20.3	-	-	-	Int	-	C	23.4	-	-	-

The capacity analysis results indicate the 2030 build condition for Colonel Glenn & Mission Point intersection meets Greene County's operational goals for Intersection LOS, Approach LOS, Movement LOS and Volume to Capacity Ratio (V/C). In the AM peak build condition for the westbound left movement, the Queue Storage Ratio (QSR) is calculated at 1.0 which means the max queue calculated by SimTraffic was equal to the available storage length. With the addition of the Gerlaugh Parcel development, the intersection is anticipated to operate at acceptable levels, even accounting for full build out of the original Mission Point development.

Table 7: Colonel Glenn Highway & Mission Point Blvd 2050 Peak Hour Traffic Analysis (Signalized)

Int #1	2050 AM No Build (Signal, 110s)						Int #1	2050 AM Build (Signal, 110s)					
	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)		Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1000'	D	43.9	0.95	0.57	488	EBT	1000'	E	56.8	0.99	0.64	485
EBR	390'	C	25	0.55	0.84	252	EBR	390'	C	31.9	0.70	0.90	301
EB App	-	D	40	-	-	-	EB App	-	D	50.9	-	-	-
WBL	515'	C	41.2	0.91	0.76	377	WBL	515'	E	59.9	1.00	1.04	504
WBT	1200'	A	2.4	0.16	0.06	54	WBT	1200'	A	2.3	0.16	0.48	441
WB App	-	C	29.5	-	-	-	WB App	-	D	44.7	-	-	-
NBL	490'	D	45.4	0.35	0.17	75	NBL	490'	D	49.1	0.43	0.22	88
NBR	490'	B	18	0.15	0.21	89	NBR	490'	B	17.5	0.17	0.21	91
NB App	-	C	24.8	-	-	-	NB App	-	C	25.3	-	-	-
Int	-	C	34.3	-	-	-	Int	-	D	46.2	-	-	-
Int #1	2050 PM No Build (Signal, 110s)						Int #1	2050 PM Build (Signal, 110s)					
	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)		Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBT	1000'	C	25.9	0.77	0.32	307	EBT	1000'	C	30.5	0.80	0.41	361
EBR	390'	B	20	0.19	0.37	117	EBR	390'	C	23.2	0.22	0.40	120
EB App	-	C	25.3	-	-	-	EB App	-	C	29.7	-	-	-
WBL	515'	D	36.7	0.72	0.47	193	WBL	515'	D	40.9	0.76	0.43	204
WBT	1200'	B	14.5	0.65	0.21	202	WBT	1200'	B	17.1	0.67	0.23	231
WB App	-	B	18.8	-	-	-	WB App	-	C	22.1	-	-	-
NBL	490'	C	21.3	0.50	0.20	103	NBL	490'	C	23	0.55	0.32	164
NBR	490'	B	18.7	0.72	0.22	121	NBR	490'	C	21.9	0.79	0.35	177
NB App	-	B	19.4	-	-	-	NB App	-	C	22.2	-	-	-
Int	-	C	20.7	-	-	-	Int	-	C	24	-	-	-

The capacity analysis results indicate the 2050 build condition for Colonel Glenn & Mission Point intersection meets Greene County's operational goals for Intersection LOS, Approach LOS and Movement LOS. In the AM peak build condition for the westbound left movement, the Volume to Capacity Ratio (V/C) is calculated at 1.0 and the Queue Storage Ratio (QSR) is calculated at 1.04. By the 2050 design horizon, the westbound left movement is calculated to be at/slightly over available capacity/storage. This calculation assumes full build of the original Mission Point development. It should be noted that the 2050 PM peak hour analysis shows acceptable levels for all of Greene County's Operational Goals. In the worst-case scenario, the AM peak hour may experience less than desirable operation for the westbound left movement entering Mission Point. For the remainder of the day, the intersection is anticipated to operate at acceptable levels.

Table 8: Mission Point Blvd & Access Peak Hour Traffic Analysis (Unsignalized)

Int #2		2030 AM Build					Int #2		2050 AM Build				
	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)		Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	380'	F	79	0.101	0.08	20	EBL	380'	F	79	0.101	0.08	28
EB App	-	F	79	-	-	-	EB App	-	F	79	-	-	-
WBR	420'	A	9.8	0.037	0.14	49	WBR	420'	A	9.8	0.037	0.11	48
WB App	-	A	9.8	-	-	-	WB App	-	A	9.8	-	-	-
SBL	100'	B	10.1	0.233	0.84	69	SBL	100'	B	10.1	0.233	0.73	68
SB App	-	B	1.4	-	-	-	SB App	-	B	1.4	-	-	-
Int	-	A	1.6	-	-	-	Int	-	A	1.6	-	-	-
Int #2		2030 PM Build					Int #2		2050 PM Build				
	Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)		Storage (ft)	LOS	Delay (sec/veh)	v/c	QSR	95th %ile Queue (ft/ln)
EBL	380'	F	87	0.497	0.19	84	EBL	380'	F	87	0.497	0.19	83
EB App	-	F	87	-	-	-	EB App	-	F	87	-	-	-
WBR	420'	D	28.6	0.575	0.36	147	WBR	420'	D	28.6	0.575	0.37	152
WB App	-	D	28.6	-	-	-	WB App	-	D	28.6	-	-	-
SBL	100'	C	20.6	0.148	0.79	58	SBL	100'	C	20.6	0.148	0.74	60
SB App	-	A	1.8	-	-	-	SB App	-	A	1.8	-	-	-
Int	-	A	4.9	-	-	-	Int	-	A	4.9	-	-	-

Analysis results for the build conditions at the Proposed Development Access indicate lengthy delays for the eastbound left movement exiting from the west side of the development. Based on ODOT calculations, the southbound left bay for the access calculates at 225' (including 50' taper). SimTraffic results indicate a max 95th percentile queue of 69' for the southbound left movement, indicating that a shorter bay (75'-100' of storage) could accommodate the proposed development traffic for this movement.

7.0 Conclusions & Recommendations Summary

Traffic impact analysis for the Gerlaugh parcel was completed for the 2030 opening year and 2050 design year with the background assumption that the full buildout of the Mission Point development is constructed as originally envisioned in the 2008 traffic study for the development. At present, one 90,000sf office building from the original plan is in operation, the remainder of the site continues to be undeveloped. Of the additional development related trips added to the certified traffic for the intersection of Colonel Glenn Highway & Mission Point Boulevard, the Gerlaugh parcel represents 17% of the additional trips in the AM and 14% in the PM peak hour while the original Mission Point development trips make up the remaining 83% and 86%, respectively. Capacity analysis results indicate the intersection Colonel Glenn Highway & Mission Point Boulevard would be approaching capacity for the westbound left movement in the AM peak hour in this "worst case" development scenario however this intersection can support the additional trips associated with the proposed Gerlaugh parcel. As development occurs and network traffic volumes change over time, it is recommended that the timing at the intersection be monitored and adjusted to ensure optimal operation particularly during the potentially heavy inbound movement during the AM peak hour. No improvements are recommended at the intersection of Colonel Glenn Highway & Mission Point Boulevard for opening day of the proposed development.

Providing access to the proposed Gerlaugh parcel development is challenging due to the limited distance (approximately 175') between Colonel Glenn Highway and the property line on Mission Point Boulevard. Currently, a landscaped median exists in the vicinity of the proposed access location. Turn lane length calculations using ODOT criteria yield a southbound left turn bay distance requirement of 225' (including taper). Queuing results from SimTraffic indicate this distance could be shortened to closer to 100'. Currently, there is only one building from the initial Mission Point development. In the short term, a break in the landscaped median could be considered to serve the proposed Gerlaugh development site as traffic volumes on Mission Point are currently very low.

Once additional development occurs on Mission Point Boulevard south of the proposed site, at that time it would be reasonable to close the median break at the Gerlaugh development access and modify the first existing internal intersection on Mission Point Boulevard to either allow for either a u-turn for vehicles accessing the Gerlaugh development, or convert this intersection to a roundabout to serve higher volumes of development traffic south on Mission Point Boulevard.

MEMORANDUM

DATE: 8/13/2024

SUBJECT: Response to 7/25/24 Goodhue Consulting Comments on Gerlaugh Traffic Impact Study Submittal

PREPARED BY: Sara Senger, PE, PTOE – TEC Engineering, Inc.

PREPARED FOR: Project Review Team

TEC has received Goodhue's 7/25/24 comments on the June 6, 2024 Traffic Impact Study for the proposed Gerlaugh Development. A virtual review meeting was held 8/8/24 to discuss the provided comments. TEC offers this formal response to comments in addition to a revised Traffic Impact Study addressing these comments.

1. **Update Table 1 to show 37 and 220 in the PM exit column for West of Mission Pt and Sum rows. The volumes analyzed within the study do appear to reflect the 37 and 220 values.**
   The TIS has been revised to reflect this comment.

2. **Was the signal timing for the Colonel Glenn and Mission Point intersection optimized? Can the timing be adjusted to reduce the queuing for the WBL movement? A QSR over 1.0 is concerning and is caused by the Gerlaugh traffic. Provide a recommendation to mitigate this queue.**
   The analysis presented in the TIS did include optimization of the Colonel Glenn & Mission Point timing. It is important to note that the QSR is the maximum queue calculated by the software divided by the available storage. The report shows that the 95th percentile queues calculated by the software can be accommodated by the existing storage bay. The 95th percentile queue is the queue length that is not exceeded more than 5% of the time during the peak hour (in this case AM peak). There are existing geometric challenges including a culvert east of Mission Point on Colonel Glenn which make roadway widening for additional storage difficult and costly. TEC believes there is some additional storage to be gained for the dual westbound left bays within the existing pavement section by restriping the existing gore area during a future resurfacing project if queueing does become an issue.

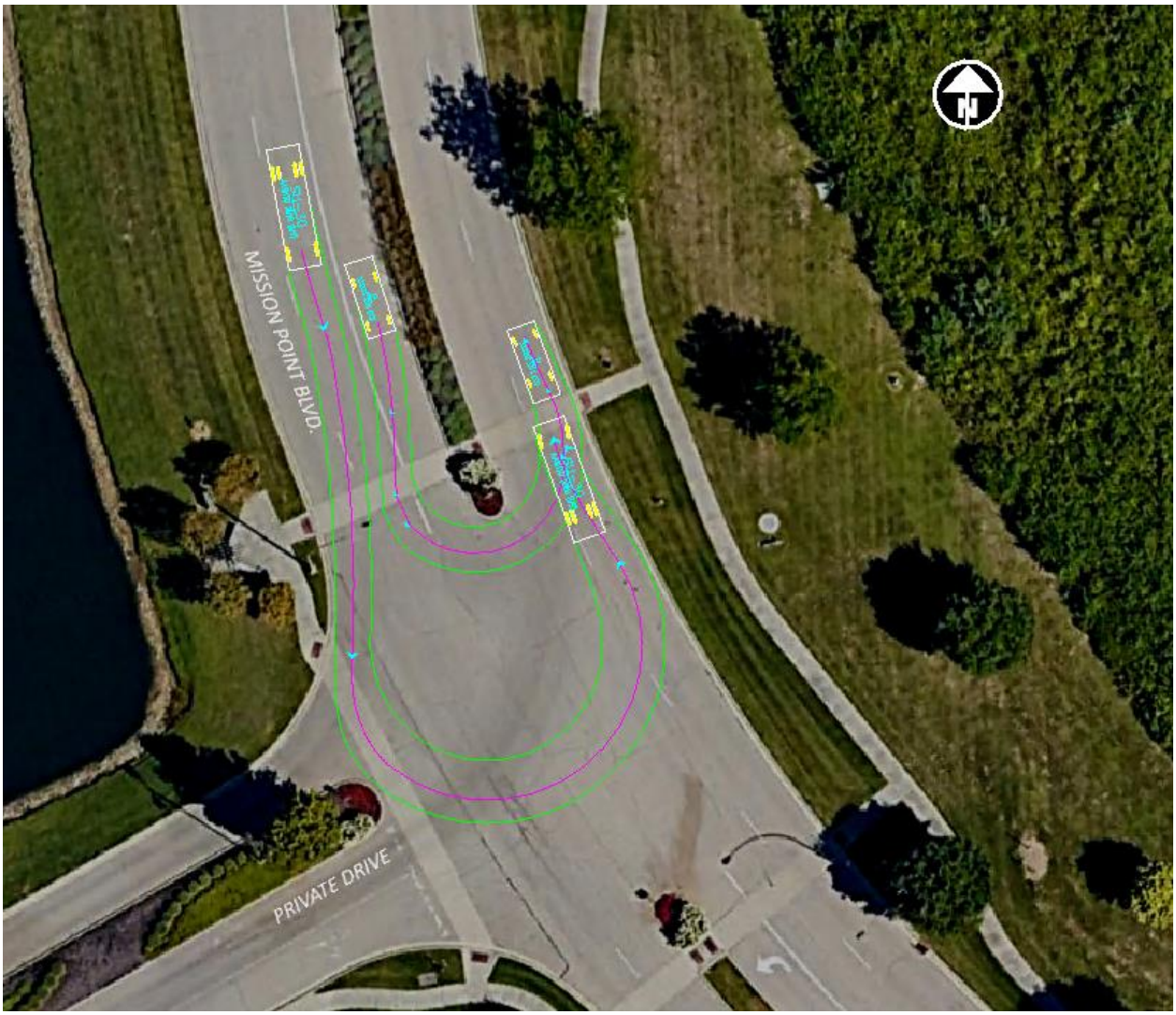
3. **Page 9 under Table 8 in the first sentence should say eastbound left.**
   The TIS has been revised to reflect this comment.

4. **After reviewing the Mission Point Development's master plan a median was planned to prohibit movements and promote access management. Cutting the existing median is not acceptable. The developer is encouraged to investigate alternative access schemes since a right-in/right-out**

will be the only movements permitted at the proposed access points on Mission Point. This may include making improvements to the south to allow for safe U-turn movements.

The developer acknowledges receipt of this comment and will work the City of Beavercreek and Greene County to accommodate a u-turn movement at the existing Mission Point/Leonardo DRS intersection. Turn templates for a standard passenger car as well as a WB-30 truck were run to evaluate u-turn movements at the existing intersection. The graphic below shows that both vehicles can be accommodated within the existing pavement section.

Figure 1: Turning Templates



To make the u-turn easier for motorists, the intersection could be modified to include a pavement bump-out on the east side. An example of this type of configuration is at Wilmington & Brown (see Figure 2). The developer proposes to work with the City/County to achieve the desired configuration for the short-term operation of this intersection until further phases of the Mission Point development are constructed.

Figure 2: Wilmington Pike & Brown U-turn bump out