# Missile Maintenance Facility and Voelz Gate Access Control Point
# Environmental Assessment (EA)

Letterkenny Army Depot, Pennsylvania

August 2025

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# ENVIRONMENTAL ASSESSMENT

## DEPARTMENT OF THE ARMY

**Letterkenny Army Depot**

**Chambersburg, Pennsylvania**

# FINDING OF NO SIGNIFICANT IMPACT

**Letterkenny Munitions Center Project at Letterkenny Army Depot**

## INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and 32 CFR Part 651, which implements NEPA for the Army as revised and published in the Federal Register on March 29, 2002, as *Environmental Analysis of Army Actions*. Pursuant to NEPA, Federal agencies are required to consider the environmental consequences of their proposed actions. NEPA typically applies when the Federal agency is the proponent of the action or where Federal funds are involved in the action.

Letterkenny Army Depot (LEAD) is located in Chambersburg, central Franklin County, Pennsylvania and contains Letterkenny Munitions Center (LEMC) within its boundaries. LEMC is a United States (U.S.) Army, government-owned facility under the command of the Joint Munitions Command (JMC). LEMC conducts regional and global contingency distribution of munitions, provides missile maintenance, and conducts demilitarization of munitions for the Army in support of all Department of Defense (DoD) and international partners to provide readiness to the warfighter.

This EA provides NEPA analysis and documentation for the Proposed Action **(Figure 1-1 and 1-2)** which includes new construction and operation of 1) Missile Maintenance Facility (MMF) and 2) Voelz Gate Access Control Point (ACP). In addition, the Proposed Action also includes the demolition of the existing Voelz Gate ACP once the new ACP is operational.

## PURPOSE AND NEED FOR THE PROPOSED ACTION

The ***purpose*** of the Proposed Action is to provide an effective and efficient maintenance facility (MF) that is compliant with *Ammunition and Explosives Safety Standards* as well as an ACP that is compliant with *Entry Control Facility Standard*. Both facilities would be capable of supporting the DoD's new Precision Strike Missile (PrSM) mission proposed at LEMC. LEMC is operated by JMC as a tier one Army Strategic Mobility Platform that provides munitions support for all DoD organizations and is a Center of Industrial and Technical Excellence (CITE) for surveillance, receipt, storage, issue, testing and repair for multiple precision fire systems.

Construction of a new MMF is ***needed*** as there are no facilities with the capacity or proper configuration to meet the PrSM system maintenance requirements on-site at LEMC. Proper

configuration includes the Explosive Safety Quantity-Distance Arcs (QD Arcs) required by the MMF. QD Arcs are safety buffers intended to protect explosive mission functions from encroaching development while also protecting life and property from explosive hazards. New habitable structures cannot exist within existing QD Arcs and new facilities with explosive hazards cannot be located such that its QD Arcs encompass existing habitable structures. Due to the nature of facilities at LEMC, many existing buildings have QD Arcs encompassing areas around them, limiting development on previously developed areas at LEMC. Proposed components of the MMF include a maintenance building, storage building, and outdoor covered test pad, as well as a covered forklift charging pad and a water storage tank to meet fire suppression requirements and will have an estimated limit of disturbance of 16 acres.

Additionally, the current Voelz Gate ACP, which is used for commercial vehicle deliveries at LEMC, is undersized and does not meet current DoD standards. In its current state, the Voelz Gate, lacks sufficient space for commercial vehicles to queue prior to inspection before entering the installation (Unified Facilities Criteria (UFC) standards for entry control ACPs). Therefore, demolition of the existing ACP and construction of an updated and DoD-compliant ACP is *needed*.

If this project is not provided, LEMC will be unable to meet Army and DoD mission standards or requirements for 1) Ammunition and explosives safety standards compliance for maintenance facilities or 2) Entry control standards for ACPs.

## DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This EA informs decision makers and the public of the likely environmental impacts of the Proposed Action and the No Action Alternative. This EA identifies, documents, and evaluates environmental effects of the proposed activity at LEMC. Environmental effects would include those related to construction and operation of the Proposed Action. The Proposed Action, No Action Alternative, and other alternatives considered but eliminated from consideration are detailed in **Section 2.0** of this EA.

The information presented in this document will serve as the basis for deciding whether the Proposed Action would result in a significant impact to the human environment, requiring the preparation of an Environmental Impact Statement (EIS), or whether no significant impacts would occur, in which case a Finding of No Significant Impact (FNSI) would be appropriate. If the Proposed Action would involve construction in a wetland as defined in Executive Order (EO) 11990, *Protection of Wetland,* a Finding of No Practicable Alternative (FONPA) would be prepared in conjunction with the FNSI.

### *Interagency Coordination and Consultations*

Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and for identifying significant concerns related to a Proposed Action. Per the requirements of Intergovernmental Cooperation Act of 1968 (42 United State Code (U.S.C.) 4231(a)) and EO 12372, *Intergovernmental Review of Federal Programs*, Federal, state, and local agencies with jurisdiction that could be affected by the Proposed Action will be notified during the development of this EA. **Appendix A** contains the list of agencies consulted during this analysis and copies of correspondence.

*Government to Government Consultations*

EO 13175, *Consultation and Coordination with Indian Tribal Governments*, directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands.

Consistent with that EO, Department of Defense Instruction (DoDI) 4710.02, *Interactions with Federally Recognized Tribes*, federally-recognized tribes that are historically affiliated with the LEAD geographic region were invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal consultation process is distinct from NEPA consultation or the interagency coordination process, and it requires separate notification to all relevant tribes. The Native American tribal governments that were coordinated or consulted with regarding these actions are listed in **Appendix A**.

*Other Agency Consultations*

Per the requirements of Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations (36 CFR Part 800); Section 7 of the Endangered Species Act (ESA) and implementing regulations; and the Migratory Bird Treaty Act (MBTA); findings of effect and request for concurrence were transmitted to the Pennsylvania State Historic Preservation Office (SHPO) and the U.S. Fish and Wildlife Service (USFWS). A full list of agencies LEAD coordinated with can be found in **Appendix A**.

Concurrence indicating a finding of no adverse effect for the construction of the Proposed Action was signed by the Pennsylvania SHPO on 8 August, 2025. A report was generated through the Information for Planning and Conservation (IPaC) system, the USFWS online system for searching for species protected under the ESA, which notes that four protected species have the potential to occur within the limit of disturbance (LOD) of the Proposed Action. In addition, a Pennsylvania Natural Diversity Inventory (PNDI) environmental review tool was generated on 4 February 2025. Correspondence regarding the findings and concurrence and resolution of any adverse effect is included in **Appendix A**.

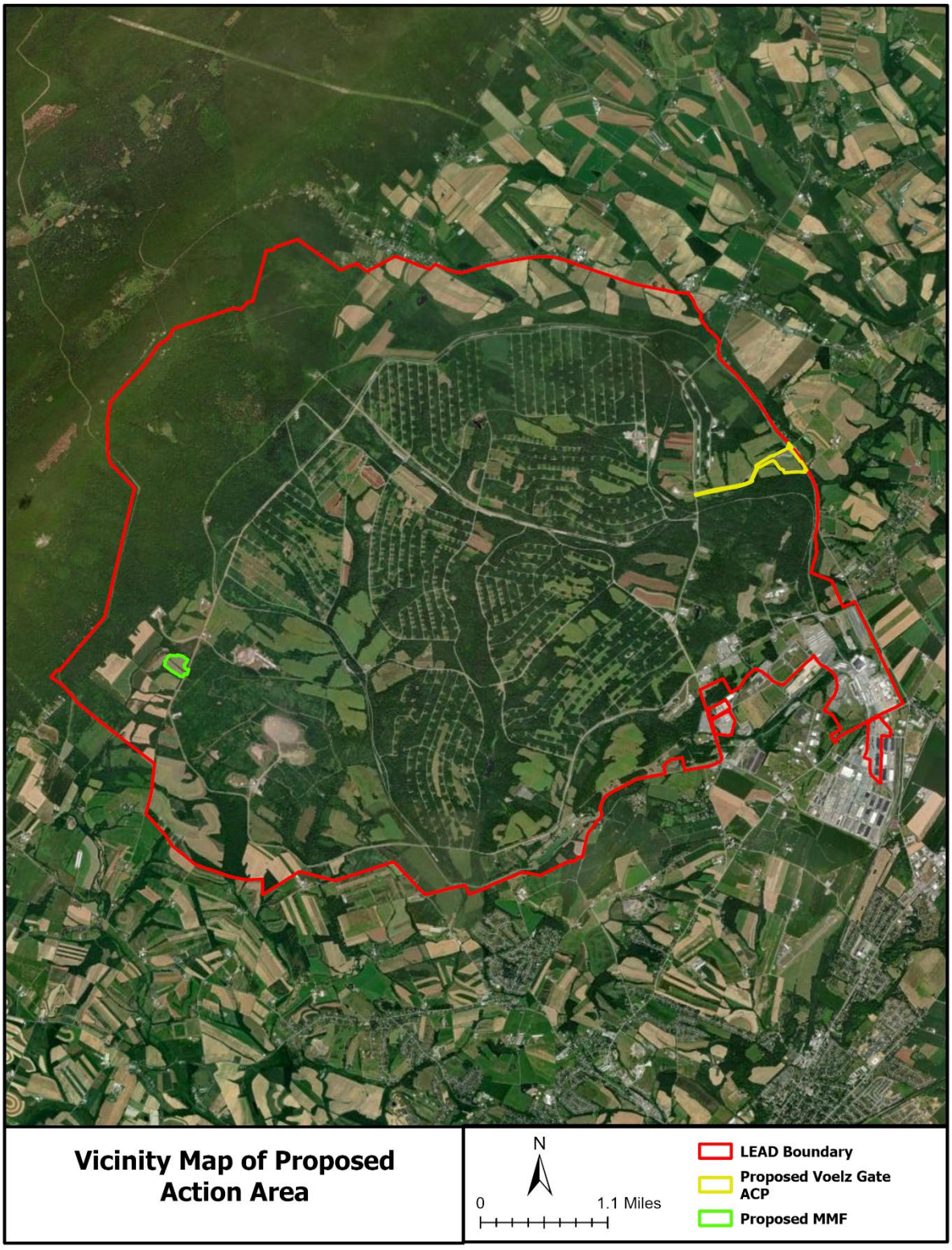


**Figure 1-1: Vicinity Map**


**Figure 1-2: Proposed Project Location Map**

## PUBLIC INVOLVEMENT

Public participation opportunities with respect to this EA and FNSI and decision making on the Proposed Action are guided by 32 CFR Part 651. According to this regulation, " to ensure early incorporation of the public into the process, a plan to include all interested or affected parties should be developed at the beginning of the analysis and documentation process. Open communication with the public is encouraged as a matter of Army policy, and the degree of public involvement varies. Appropriate public notice of the availability of the completed EA/draft/FNSI shall be made (see 651.35)".

The EA was made available for public review online at https://www.letterkenny.army.mil/ and https://www.amc.army.mil/Resources/Environmental/. The Notice of Availability for the Draft EA was published in the *Chambersburg Public Opinion*. All comments received during this public review period, which include agency responses but no public comments, have been considered and incorporated in the Final EA.

The EA and draft FNSI were also available by request from LEAD. Comments received during the 30-day public review period were addressed and documented in the final EA and draft FSNI, as appropriate. All coordination letters and responses received during the preparation of this EA are located in **Appendix A**.

At the end of the 30-day public review period, LEAD considered any comments submitted by individuals, agencies, or organizations on the Proposed Action, the EA, or Draft FNSI, if applicable. As appropriate, LEAD may then execute the FNSI and proceed with implementation of the Proposed Action. If it is determined prior to issuance of a final FNSI that implementation of the Proposed Action would result in significant impacts, LEAD will publish in the *Federal Register* a Notice of Intent (NOI) to prepare an EIS, commit to mitigation actions sufficient to reduce impacts below significance levels, or not take the action.

## ENVIRONMENTAL LAWS AND REGULATIONS

Army decisions that affect environmental resources and conditions occur within the framework of numerous laws, regulations, and EOs. Some of these authorities prescribe standards for compliance while others require specific planning and management actions to protect environmental values potentially affected by Army actions. Compliance with the following environmental regulations and EOs include, but are not limited to, the Clean Air Act (CAA), Clean Water Act (CWA), Section 106 of the NHPA, Coastal Zone Management Act, the ESA, Fish and Wildlife Coordination Act, Archaeological Resources Protection Act, MBTA, Noise Control Act, and *Protection of Children from Environmental Health Risks and Safety Risks* (EO 13045).

## SUMMARY OF ENVIRONMENTAL IMPACTS

As detailed in this EA, construction activities associated with the Proposed Action would generate adverse impacts to natural resources, but no significant adverse impacts would occur. These impacts would be temporary, lasting approximately only during the construction phase. The intensity of the adverse impacts would be limited to the area immediately surrounding the Proposed Action area.

During operation, long-term, minor, direct, adverse impacts would occur. On a cumulative basis, the Proposed Action would also have long-term, minor, indirect, adverse impacts. **Table FNSI-1** below summarizes the potential consequences the Proposed Action and No Action Alternative would have on resources evaluated in the EA.

***Table FNSI-1. Summary of Environmental Consequences***

| Resource | Construction | Operation | No Action |
|---|---|---|---|
| **Land Use** | Short- and long-term, direct, moderate, adverse impact on land use due to construction staging and conversion of agricultural fields to developed land. | Long-term, minor, direct adverse effects on land use from the conversion of agricultural land to developed land. | No impact |
| **Viewshed** | Short-term, direct, minor adverse impacts due to construction staging. | Overall, long-term, direct, minor, adverse impacts from the construction of a new building in an agricultural field. | No impact. |
| **Geology, Topography, and Soil** | Short-term, minor, direct adverse impacts to topography with the grading of the MMF and ACP Voelz Gate sites. No impacts to geology. Short- and long-term, moderate, direct impacts to soil from arable land conversion to developed land. | No impacts to geology or topography after construction. Long-term, moderate, direct adverse impact to soils from the conversion of arable land to compacted, non-productive land. | No impact |
| **Prime Farmland** | Long-term, moderate, direct, adverse impacts from conversion of up to 13 acres of farmland into developed land. | Long-term, minor, direct, adverse impacts from permanent soil compaction. | No impact |
| **Water Resource (Surface Water, Stormwater, Floodplains, Wetlands, and Groundwater)** | Short-term, minor, direct, adverse impacts to surface water and stormwater from sediment deposition, and conversion of permeable to impervious surface. Short-term, minor, | Long-term, direct, negligible, adverse impacts to surface water due to conversion of permeable land to impervious. Long-term, direct, minor, adverse impacts to stormwater due to potential increased runoff. Short-term, minor, indirect adverse impact to | No impact |

| Resource | Construction | Operation | No Action |
|---|---|---|---|
| | indirect adverse impact to wetlands. Short-term, indirect, negligible, adverse impacts to groundwater from potential accidental releases of petroleum. No impacts to floodplains. | wetlands. No impacts to floodplains. | |
| **Biological Resources (Vegetation, Wildlife, Rare, Threatened, and Endangered Species[RTE])** | Overall, short-and long-term, minor, direct, adverse impacts to vegetation, wildlife, and RTEs due to removal and/or trampling, noise from construction and habitat removal, and accidental discovery or take of RTE species, respectively. | Overall, long-term, minor, direct, adverse impacts vegetation. Long-term, negligible, direct, adverse impacts to wildlife and RTEs from operational noises. | No impact |
| **Cultural Resources** | No impacts to cultural resources as no archeological sites are present. | No impact | No impact |
| **Hazardous and Toxic Materials and Waste** | Short-term, direct, minor , adverse impacts due to the use of chemicals and fuels during construction and the release of hazardous materials during demolition. | No impact | No impact |
| **Utilities (Potable Water, Wastewater, Energy Sources, Natural Gas, Communications, and Solid Waste)** | Long-term, minor, direct, adverse impacts due to increased demands on existing utility structures. | Long-term, minor, direct, adverse impacts due to increase utility usage | No impact |
| **Transportation and Traffic** | Short-term, minor, direct, adverse impacts to additional traffic during construction. | No impact | No impact |
| **Noise** | Short-term, minor, direct, adverse impacts due to increase in noise | Long-term, minor, direct, adverse impacts due to operational noises. | No impact |

| Resource | Construction | Operation | No Action |
|---|---|---|---|
| | during construction and demolition. | | |
| **Air Quality** | Short-term, minor, direct, adverse impacts from construction emissions. | Long-term, minor, direct, adverse impacts from the operation of the MMF & ACP. | No impact |
| **Human Health and Safety** | No impact | No impact | No impact |
| **Socioeconomics and Protection of Children)** | Short-term, minor, direct, beneficial impacts to socioeconomics due to job creation during construction. No impact to protection of children. | No impact | No impact |
| **Cumulative Impacts** | No impact | Long-term, minor, indirect, adverse impacts from increase pollutant emissions, and increased impervious surface, noise, vegetation removal, and soil degradation. | No impact |

## CONCLUSION AND FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the EA and find that the Proposed Action for the MMF and Voelz Gate ACP at LEAD will have no significant impacts on the natural environment, cultural resources, or the environment. Based on these findings, an Environmental Impact Statement is not required for this project and this FNSI shall be issued.

CALEB A. LEWIS
COL, LG COMMANDING

Date

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# 1.0 INTRODUCTION

## 1.1 PROJECT BACKGROUND

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This EA provides NEPA analysis and documentation for the Proposed Action (**Figure 1-1 and 1-2**) which includes new construction and operation of 1) Missile Maintenance Facility (MMF) and 2) Voelz Gate Access Control Point (ACP). In addition, the Proposed Action also includes the demolition of the existing Voelz Gate ACP once the new ACP is operational.

## 1.2 PURPOSE AND NEED

The ***purpose*** of the Proposed Action is to provide an effective and efficient maintenance facility (MF) that is compliant with Ammunition and Explosives Safety Standards as well as an ACP that is compliant with Entry Control Facility Standard for ACPs. Both facilities would be capable of supporting the DoD's new Precision Strike Missile (PrSM) mission proposed at LEMC. LEMC is operated by JMC as a tier one Army Strategic Mobility Platform that provides munitions support for all DoD organizations and is a Center of Industrial and Technical Excellence (CITE) for surveillance, receipt, storage, issue, testing and repair for multiple precision fire systems. The proposed MMF will serve as the main location for missile maintenance and the new ACP will provide critical commercial vehicle (tractor trailer) shipping and receiving operations to support the PrSM program.

Construction of a new MMF is ***needed*** as there are no facilities with the capacity or proper configuration to meet the PrSM system maintenance requirements on-site at LEMC. Proper configuration includes the Explosive Safety Quantity-Distance Arcs (ESQD Arcs) required by the MMF. ESQD Arcs are safety buffers intended to protect explosive mission functions from encroaching development while also protecting life and property from explosive hazards. New habitable structures cannot exist within existing ESQD Arcs and new facilities with explosive hazards cannot be located such that its ESQD Arcs encompass existing habitable structures. Due to the nature of facilities at LEMC, many existing buildings have ESQD Arcs encompassing areas

around them, limiting development on previously developed areas at LEMC. Proposed components of the MMF include a maintenance building, storage building, outdoor covered test pad, as well as a covered forklift charging pad and a water storage tank to meet fire suppression requirements and will have an estimated limit of disturbance of 16 acres.

Additionally, the current ACP, Voelz Gate, which is used for commercial vehicle deliveries at LEMC, is undersized and does not meet current DoD standards. In its current state, the Voelz Gate, lacks sufficient space for commercial vehicles to queue prior to inspection before entering the installation (Unified Facilities Criteria (UFC) standards for entry control ACPs). Therefore, demolition of the existing ACP and construction of an updated and DoD-compliant ACP is needed.

If this project is not provided, LEMC will be unable to meet Army and DoD mission standards or requirements for 1) Ammunition and explosives safety standards compliance for maintenance facilities or 2) Entry control standards for ACPs.

## 1.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA informs decision makers and the public of the likely environmental impacts of the Proposed Action and the No Action Alternative. This EA identifies, documents, and evaluates environmental effects of the proposed activity at LEMC. Environmental effects would include those related to construction and operation of the Proposed Action. The Proposed Action, No Action Alternative, and other alternatives considered but eliminated from consideration are detailed in **Section 2.0** of this EA.

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The existing conditions at LEAD are described in **Section 3.0**, *Affected Environment and Environmental Consequences*. The evaluation of potential impacts from the Proposed Action can also be found in **Section 3.0**, following the descriptions of each resource area. The following resources are evaluated in this EA: land use; viewshed; geology, topography, and soils; prime farmland; water resources; biological resources; cultural resources; hazardous and toxic waste; utilities; transportation and traffic; noise; air quality; human health and safety; socioeconomics; and cumulative impacts.

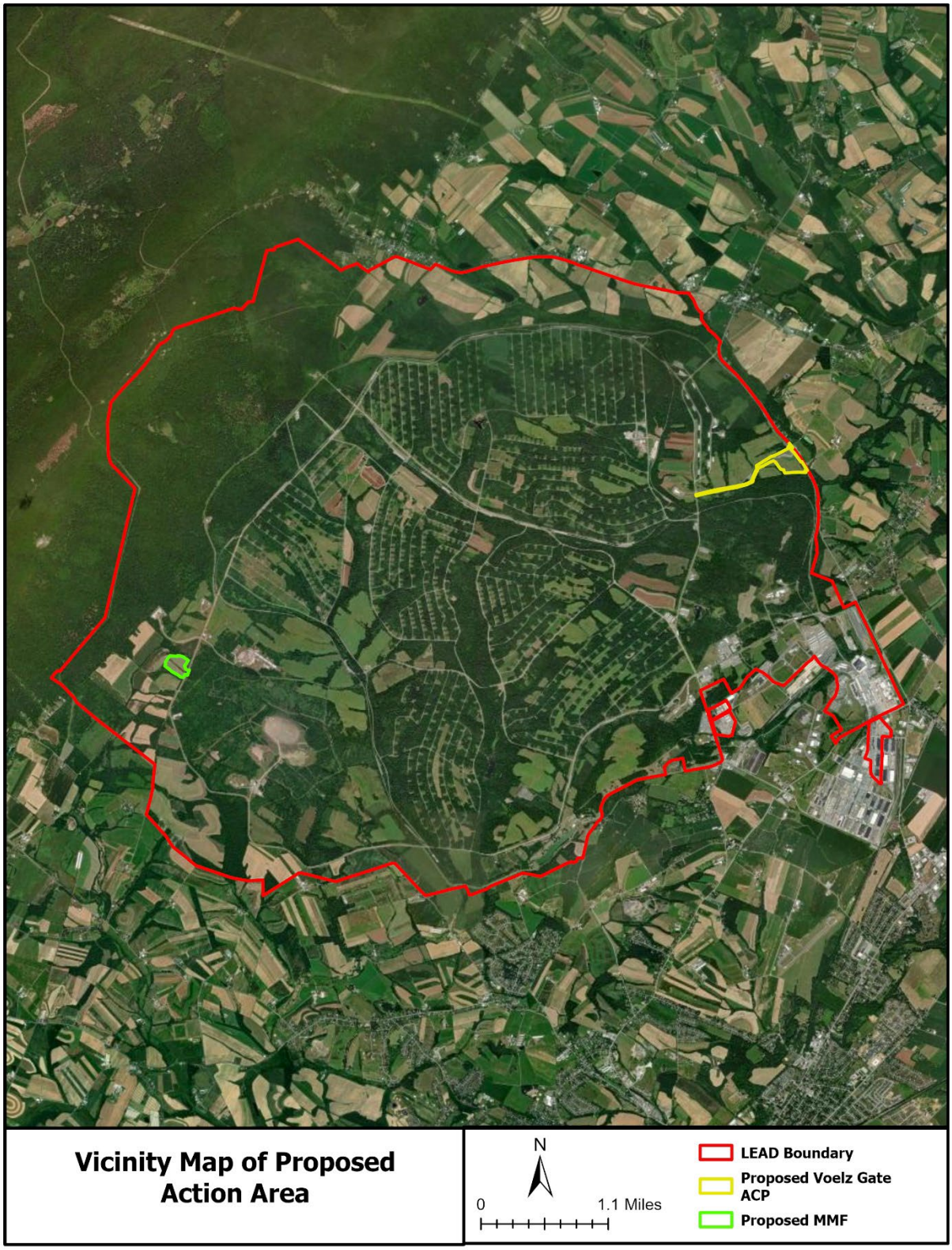


***Figure 1-1:Vicinity Map***


***Figure 1-2:Proposed Project Location Map***

To the extent possible, analyses of the resources presented in this EA are streamlined based on the anticipated level of potential impact. The following resource areas are not analyzed in this EA because the Proposed Action either has no potential to affect them, or the potential impacts would be negligible:

***Airspace.*** No impacts to airspace from construction or operation activities related to the Proposed Action are expected to occur.

***Designated Natural Areas.*** No Wild or Scenic Rivers, Natural Areas, or National Forests are present in the Proposed Action area.

### *1.3.1 Interagency Coordination and Consultations*

Scoping is an early and open process for developing the breadth of issues to be addressed in the EA and for identifying significant concerns related to a Proposed Action. Per the requirements of Intergovernmental Cooperation Act of 1968 (42 United State Code (U.S.C.) 4231(a)) and EO 12372, Intergovernmental Review of Federal Programs, Federal, state, and local agencies with jurisdiction that could be affected by the Proposed Action will be notified during the development of this EA.

**Appendix A** contains the list of agencies consulted during this analysis and copies of correspondence.

### *1.3.2 Government to Government Consultations*

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The Native American tribal governments that were coordinated or consulted with regarding these actions are listed in **Appendix A**.

### *1.3.3 Other Agency Consultations*

Per the requirements of Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations (36 CFR Part 800); Section 7 of the Endangered Species Act (ESA) and implementing regulations; and the Migratory Bird Treaty Act (MBTA); findings of effect and request for concurrence were transmitted to the Pennsylvania State Historic Preservation Office (SHPO) and the U.S. Fish and Wildlife Service (USFWS). A full list of agencies LEAD coordinated with can be found in **Appendix A**.

Concurrence indicating a finding of no adverse effects for the construction of the Proposed Action was signed by the Pennsylvania SHPO on [Date]. On 30, July 2025, a report was generated through the Information for Planning and Conservation (IPaC) system, the USFWS online system for searching for species protected under the ESA, which notes that four protected species have the potential to occur within the limit of disturbance (LOD) of the Proposed Action. In addition, a Pennsylvania Natural Diversity Inventory (PNDI) environmental review tool was generated on 4 February 2025 Correspondence regarding the findings and concurrence and resolution of any adverse effect is included in **Appendix A**.

## 1.4 PUBLIC INVOLVEMENT

Public participation opportunities with respect to this EA and FNSI and decision making on the Proposed Action are guided by 32 CFR Part 651.

A Notice of Availability (NOA) of the EA and Draft FNSI were published in the Chambersburg Opinion, announcing the availability of the documents for review. The NOA invited the public to review and comment on the EA and Draft FNSI. The NOA and public and agency comments are provided in **Appendix A**.

The NOA was published in the *Chambersburg Public Opinion*. Electronic copies of the EA and Draft FNSI were made available for review on the LEAD environmental website, at https://www.letterkenny.army.mil/ and https://www.amc.army.mil/Resources/Environmental/.

Comments received during the 30-day public review period have been addressed and documented in the Final EA, as appropriate. All coordination letters and responses received during the preparation of this EA are located in **Appendix A**.

At the end of the 30-day public review period, LEAD considered any comments submitted by individuals, agencies, or organizations on the Proposed Action, the EA, or Draft FNSI, if applicable. As appropriate, LEAD may then execute the FNSI and proceed with implementation of the Proposed Action. If it is determined prior to issuance of a final FNSI that implementation of the Proposed Action would result in significant impacts, LEAD will publish in the *Federal Register* a Notice of Intent (NOI) to prepare an EIS, commit to mitigation actions sufficient to reduce impacts below significance levels, or not take the action.

## 1.5 ENVIRONMENTAL LAWS AND REGULATIONS

Army decisions that affect environmental resources and conditions occur within the framework of numerous laws, regulations, and Executive Orders (EO). Some of these authorities prescribe standards for compliance while others require specific planning and management actions to protect environmental values potentially affected by Army actions. Compliance with the following environmental regulations and EOs include but are not limited to the EOs and regulations presented in **Table 1-1** below.

***Table 1-1 Compliance with Federal Environmental Statutes and Executive Orders***

| Acts | Compliance |
|---|---|
| Archaeological Resources Protection Act (ARPA) of 1979 | FULL |
| Clean Air Act, as amended (42 United States Code [U.S.C.] | FULL |
| Clean Water Act, as amended (33 U.S.C. ch. 23 §1151) | FULL |
| Coastal Zone Management Act (CZMA) of 1972, as amended | FULL |
| Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. §9601 et seq.) | FULL |
| Section 438 of the Energy Independence and Security Act (42 U.S.C. ch. 152 §17001 et seq.) | FULL |
| Endangered Species Act of 1973, as amended (16 U.S.C. ch. 35 §1531 et seq.) | FULL |
| Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e) | FULL |
| Migratory Bird Treaty Act (16 U.S.C §§703-712, et seq.) | FULL |
| National Defense Authorization Act of 2018 (Public Law 115-91) | FULL |
| National Environmental Policy Act of 1969 (42 U.S.C. §4321 et seq.) | FULL |
| National Historic Preservation Act of 1966, as amended (16 U.S.C. ch. 1A, subch. II §470 et seq.) | FULL |
| Noise Control Act of 1972, as amended (42 U.S.C. §§4901-4918, et seq.) | FULL |
| North American Wetlands Conservation Act (16 U.S.C. 4401-4412) | FULL |
| Resource Conservation and Recovery Act (42 U.S.C. ch. 82 §6901 et seq.) | FULL |
| Safe Drinking Water Act, as amended (42 U.S.C. §300f) | FULL |
| Solid Waste Disposal Act of 1965, as amended (42 U.S.C 6901 et seq.) | FULL |
| Toxic Substances Control Act of 1976 (15 U.S.C. ch.53, subch. I §§2601-2629) | FULL |
| Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et seq.) | FULL |
| Wild and Scenic Rivers Act (16 U.S.C. 1271, et seq.) | FULL |
| Sikes Act, as amended (16 U.S.C. 670a-670o) | FULL |
| **Executive Orders (EO)** | |
| Protection and Enhancement of the Cultural Environment (EO 11593) | FULL |
| Protection of Wetlands (EO 11990) | FULL |
| Federal Compliance with Pollution Control Standards (EO 12088) | FULL |
| Protection of Children from Environmental Health Risks and Safety Risks (EO 13045) | FULL |
| Invasive Species (EO 13112) | FULL |
| Consultation and Coordination with Indian Tribal Governments (EO 13175) | FULL |
| Chesapeake Bay Protection and Restoration (EO 13508) | FULL |
| Floodplain Management (EO 11988) | FULL |

# 2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action and Alternatives to the Proposed Action.

## 2.1 PROPOSED ACTION

The Proposed Action consists of the new construction of the MMF and Voelz Gate ACP.

MMF

The total construction for the MMF is an estimated 16 acres of disturbance on the northeastern edge of LEMC. The proposed site location for the MMF is owned by LEMC; however, it is leased for private agricultural use. The proposed MMF construction includes perimeter fencing, roadways for inbound and outbound commercial vehicles, personnel parking, and four individual buildings, described below. Additionally, the MMF requires ESQD Arcs that do not encompass existing habitable structures. **Figure 2-1** depicts the proposed concept design.

1) Maintenance building

   a. Additional facilities included within the maintenance building include, administrative, parts and equipment storage, and staff spaces (breakrooms, lockers, conference rooms).

2) Inert storage building

3) Outdoor covered testing pad

The proposed MMF includes stormwater management ponds along with extensive grading necessary for building construction, and a parking area for government and commercial vehicles. Designs for the MMF will follow the standard design criteria for Rocket and Missile Maintenance Building (as of 2024 no standard design under UFC exists for this specific category code) and explosive safety criteria per Defense Explosives Safety Regulation (DESR) 6055.9 (02.2024) will be followed

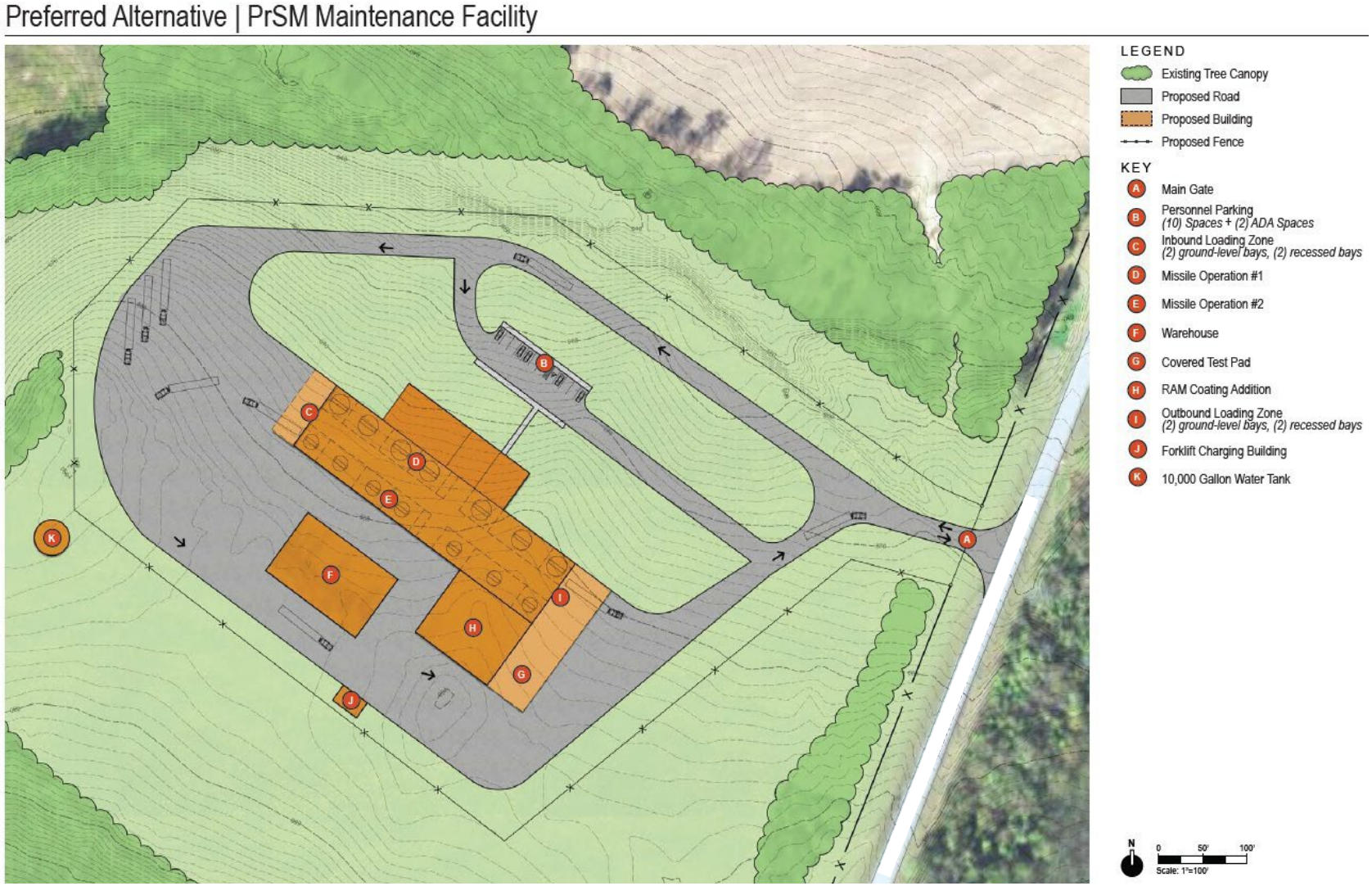


***Figure 2-1: Proposed MMF Design***

Voelz Gate

The total construction for the Voelz Gate ACP is an estimated 32 acres of disturbance. The proposed location, on the northwestern portion of LEMC, will encompass the existing ACP footprint and LEMC land that is currently leased for private agricultural use. The total proposed construction includes one outbound and two inbound vehicle lanes, queuing space for an estimated 26 commercial vehicles, 100 parking spaces for empty outbound vehicles, up to three individual buildings, and three truck inspection canopies. These are all described in detail below. Additionally, the proposed ACP must follow ESQD Arcs requirements and cannot be built within an existing ESQD Arc. **Figure 2-2** depicts the proposed concept design. The design would comply with UFC 4-022-01 *Security Engineering: Entry Control Facilities / Access Control Points* and applicable laws and executive orders.

1) Gatehouse building. Building design includes operational spaces and storage.

2) Search building would include staff facilities (breakroom, offices, and storage). This building could be combined into one facility with the Gatehouse building described above.

3) Overwatch

4) Truck inspection canopy, three separate canopies

The proposed Voelz Gate will replace the existing ACP. This will require demolition of the existing ACP once construction is complete. The proposed 100 parking spaces for empty outbound vehicles will be constructed on the former ACP footprint.

## 2.2 NO ACTION ALTERNATIVE

A No Action Alternative is to be analyzed in an EA to provide a comparative basis for the Preferred Alternative. Under the No Action Alternative, the Proposed Action would not be implemented.

MMF

Under the No Action Alternative, no new facilities or supporting infrastructure to support DoD's PrSM program would be built at LEMC, and the site would remain leased agricultural land. LEMC would be incapable of serving as the CITE for maintenance of the PrSM program, impacting DoD's PrSM mission goals. Furthermore, if the MMF was not constructed, there would not be a missile maintenance facility in place to support PrSM sustainment requirements. LEMC would not be able to provide missile maintenance operations for the PrSM in a safe and effective manner and the ability for LEMC to support future missile systems would be jeopardized

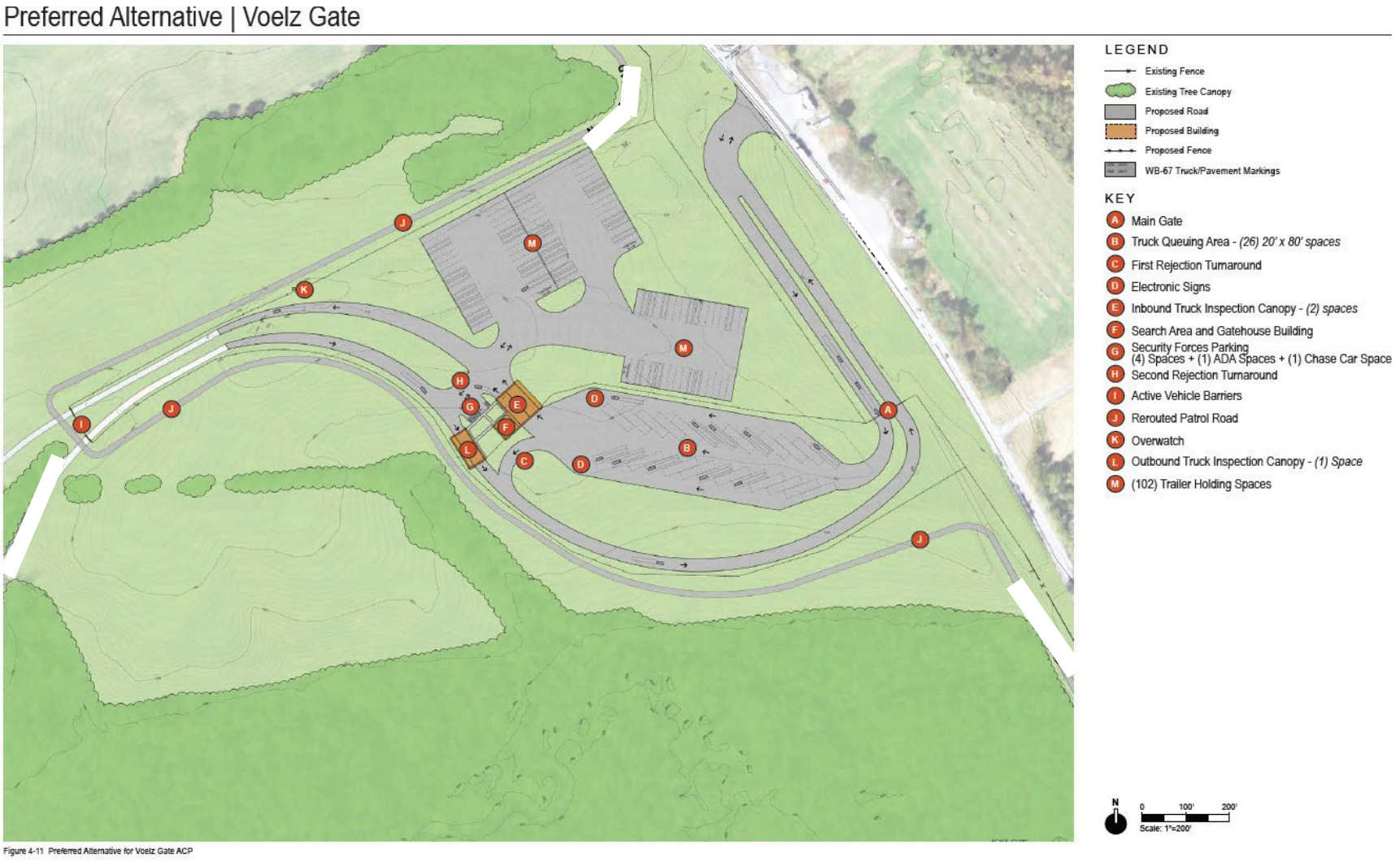


***Figure 2-2: Proposed Voelz Gate ACP Design***

Voelz Gate ACP

Under the No Action Alternative, no construction to improve the Voelz Gate ACP would occur. The current ACP would continue to be utilized, although it does meet commercial vehicle ACP DoD standards and approximately 18 acres would remain in agricultural lease. Incoming commercial vehicles would continue to use a facility that does not meet the requirements for a Commercial Vehicle ACP and LEMC would be out of compliance with DoD's ACP performance standards for controlling access to the installation.

## 2.3 OTHER ALTERNATIVES CONSIDERED BUT ELIMINATED

Seven alternatives were analyzed and considered for the Proposed Action but were ultimately eliminated from consideration. These alternatives must meet the following screening requirements listed below for the MMF and Voelz gate ACP in order to be further evaluated:

- Alternatives for the MMF
  - Must meet specific space requirements. All potential existing infrastructure at LEMC is at capacity; therefore, no existing buildings were considered in the analysis.
  - Must meet ESQD Arcs requirements; new facilities with explosive hazards cannot be located such that their ESQD Arcs encompass existing habitable structures.
  - PrSM operations are inherently governmental activities and need to be kept within a controlled DoD perimeter. The only nearby facilities that meet this requirement are Carlisle Barracks and Navy Support Activity in Mechanicsburg.
- Alternatives for the Voelz Gate ACP
  - Must conform with the requirements of UFC 4-022-01. The current Voelz Gate is nonconforming.
  - Must meet specific space requirements to accommodate an additional inbound inspection lane, commercial vehicle parking and queuing, and covered canopies for commercial vehicle inspection.
  - Must meet ESQD Arcs requirement; cannot be built in an area with an existing ESQD Arc.
- Alternatives must meet missions/project objectives as stated in **Section 1.2 Purpose and Need**.

### *2.3.1 Status Quo (Current Operations)*

Under this alternative, vacant or underutilized facilities that have the appropriate building configuration and space to meet requirements for maintaining the PrSM program, ACP, and do not require renovation or new construction would be used. Buildings at LEAD that may meet the parameters of the PrSM are already being used for maintaining existing missile systems. Additionally, UFC and DESR do not permit the maintenance of multiple missile systems in a single missile maintenance facility and thereby do not permit the introduction of a new missile system into existing facilities that are currently maintaining existing missile systems. The existing Voelz Gate ACP is an existing facility; however, it does not currently meet UFC requirements for a Commercial Vehicle ACP, and there are no other current facilities at LEMC that meet those requirements.

### 2.3.2 Renovation Only

Under this alternative, unoccupied facilities would be renovated, limiting disturbance to the facilities existing footprint, to meet the needs of the PrSM program. There are no known unoccupied facilities at LEMC that can be renovated that meet DESR or space requirements of the PrSM program. Specifically, DESR does not permit a facility's ESQD Arc to overlap with another proposed facility's ESQD Arc or to an area where occupied buildings exist. As for the proposed ACP, Voelz Gate is the only viable Commercial Vehicle ACP, but it would require complete reconstruction in order to meet the requirements of the Proposed Action.

### 2.3.3 Renovation and New Construction Combination

Under this alternative, a mix of existing building renovation and new construction were considered. This alternative attempted to use existing facilities within LEMC, some of which would require renovation, alongside the construction of new buildings to account for the lack of space in existing facilities. Although renovation of assigned facilities could improve associated appearance characteristics, it would not adequately address the large deficit of space and new development constraints at LEAD. Additionally, this alternative would not meet DESR requirements and there is no existing facility identified within the Real Property Inventory that could be renovated to adequately meet the PrSM program objectives.

### 2.3.4 Leasing outside LEAD

Under this alternative, an existing facility outside LEAD would be leased and replaced by the MMF. In order to meet PrSM program requirements, this facility would need to be within a secure area within LEMC boundary, therefore, this alternative is nonviable.

### 2.3.5 Other Facilities at LEAD

Under this alternative, existing facilities at LEMC would be utilized to meet PrSM requirements and an ACP other than the Voelz Gate would be utilized. Currently, no other existing facility at LEMC can meet the space, safety (outside of ESQD Arcs or maintenance of single missile system), or security requirements to meet the Proposed Action.

### 2.3.6 Other DoD Agencies of Federal Agency Facilities

Under this alternative, other DoD or Federal Agency Facilities could be leased to fulfill the mission requirements. The only nearby facilities that meet this requirement are Carlisle Barracks and the Navy Support Activity Mechanicsburg; however, neither of these have facilities that could support the mission and the PrSM program must be within LEMC boundaries.

### 2.3.7 Contract the Services

Under this alternative, MMF maintenance would be the responsibility of a contractor. This would not meet security standards if the facilities were not within a DoD-controlled perimeter.

*Table 2-1: Alternative Considerations and Requirements*

| Alternative | Meets Space Requirement | QD Arc Compliance | Inside a Controlled DoD Property Perimeter | Meets Missions/Project Objective |
|---|---|---|---|---|
| **New Construction (Preferred Alternative)** | **X** | **X** | **X** | **X** |
| **No Action Alternative** | | | | |
| **Status Quo (Current Operations)** | | **X** | **X** | |
| **Renovation Only** | | | **X** | |
| **Renovation/New Construction Combination** | | | **X** | |
| **Leasing Outside LEAD** | **X** | **X** | **X** | |
| **Other Facilities at LEAD** | **X** | **X** | | |
| **Other DoD Agencies or Federal Agency Facilities** | **X** | **X** | **X** | |
| **Contract the Services** | | | | |

# 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents the affected environment at the Proposed Action area and analyzes the environmental consequences of implementing the Proposed Action and No Action Alternative. The impacts of a proposed action can vary in duration. Two levels of impact duration could occur: short-term and long-term. Short-term impacts are temporary and generally occur during construction with the resource returning to preconstruction condition almost immediately afterward or represent impacts that may last up to two years following construction. Impacts considered long-term would occur if the resource would require more than five years to recover or result in a permanent change from an activity that affects a resource for the life of the project or beyond.

## 3.1 LAND USE

### *3.1.1 Affected Environment*

LEMC occupies the majority of LEAD's 18,668 acres. Its facilities include explosive operating buildings, explosive storage space, igloos, above-ground magazines, rail docks. LEMC's land use includes ammunition storage (Zone 1) and a buffer zone (Zone 2). The ammunition storage area consists of semi-improved and unimproved land. The associated activities include ammunition storage, tactical missile storage & assembly, open burning/open detonation, a firing range, agricultural out leasing, wildlife management, and recreational hunting and fishing. Included in this area are ESQD arcs. ESQD arcs are safety buffers intended to protect explosive mission functions from encroaching development while protecting life and property from explosive hazards. Inhabited development, incompatible with explosives operations is prohibited within ESQD arcs.

The buffer zone consists of semi-improved and unimproved land. Zone II associated activities include agricultural out leasing, forestry management, wildlife management, and recreational hunting and fishing. LEMC has a large number of acres of agricultural land in the ammunition storage area and buffer area that are leased to area farmers for crop production. LEMC is bordered by agricultural lands to the north and south, the state forest and state game management land to the west, and LEAD cantonment to the east.

More than 85% of the land in Franklin County is agriculture or forest. There are several residential developments and a commercial shopping strip along U.S. 11 that service the LEAD and Chambersburg. LEMC is bordered by the Buchanan State Forest to the west and Pennsylvania State Game Lands (SGL) to the west and south of the Installation. Several farms along the LEMC border are classified as protected agricultural land under the state Agricultural Easement program (LEMC, 2020).

The proposed site for the MMF is currently used as an agricultural field. The Voelz Gate ACP site is approximately 16 acres of active farmland; however, both sites are categorized entirely as either agricultural tract or agricultural field. (**Figure 3-1).**

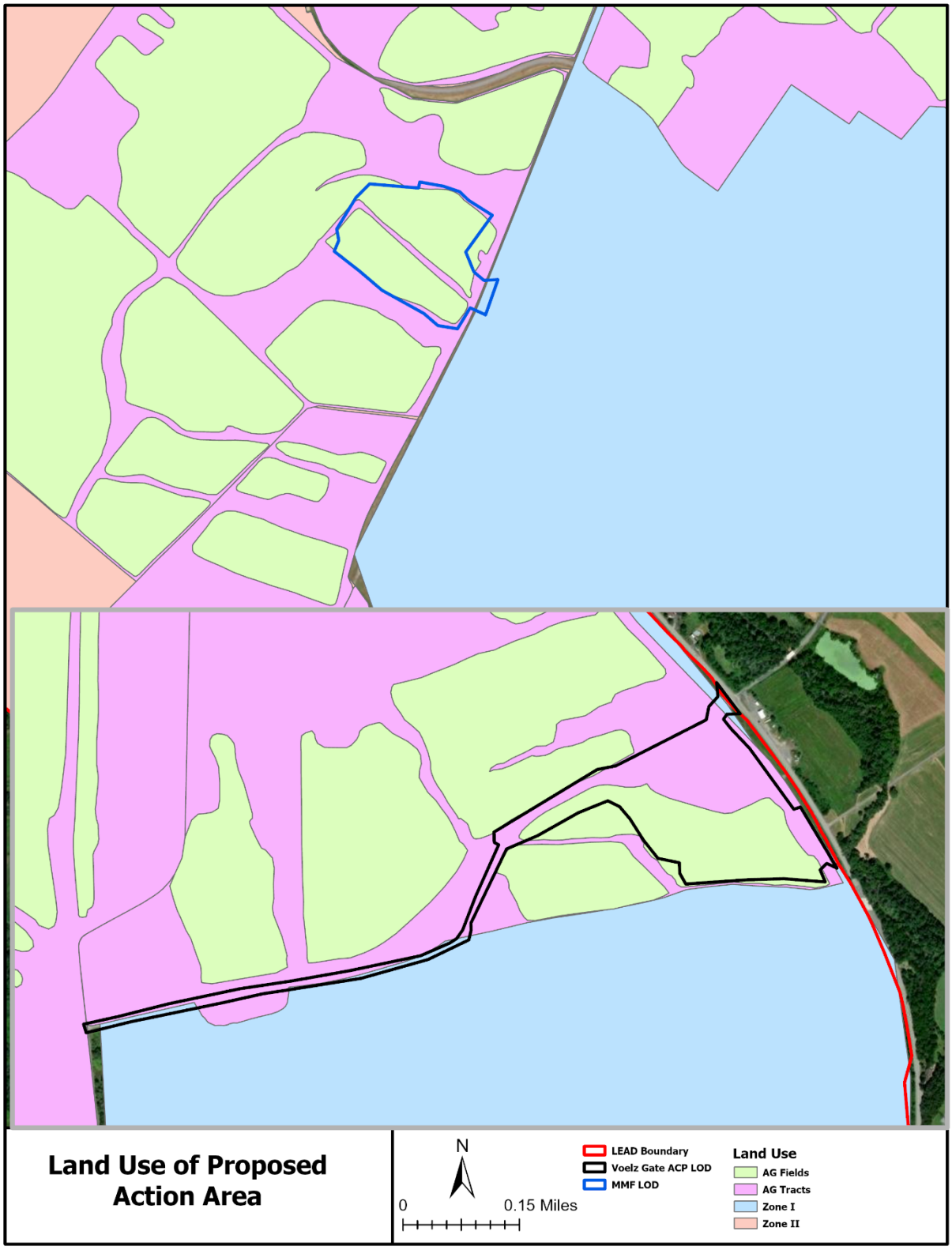


***Figure 3-1: Land Use on LEAD***

### *3.1.2 Environmental Consequences*

#### *3.1.2.1 Significance Criteria*

An alternative would be expected to have a significant adverse impact on land use if:

- It is inconsistent with existing land use plans or policies
- It prohibits the viability of existing land use
- Surrounding land use would be expected to substantially change in the short or long-term
- It conflicts with adjacent land use to the extent that public health or safety is threatened
- It is incompatible with planning criteria that ensures the safety and protection of human life and property

#### *3.1.2.2 Impacts from the Construction of the Proposed Action*

MMF

During construction, there would be short-term, moderate, direct, adverse impacts to land use from construction, and construction related activities including topsoil removal, tree clearing, and staging of heavy equipment on agricultural land. Approximately 16 acres of farmland would be lost and converted to a highly disturbed, developed land use.

Voelz Gate ACP

During construction, there would be short-term, moderate, direct, adverse impacts to land use from construction, and construction related activities including topsoil removal, and staging of heavy equipment on agricultural land. Approximately 16 acres of farmland would be lost and converted to a highly disturbed, developed land use.

Overall, impacts to land use from the construction of the Proposed Action (MMF and Voelz Gate ACP) are considered moderate as LEAD contains over 10,000 acres of agricultural land. When compared to the total agricultural land available at the site, the loss of a combined 32 acres due to construction of the Proposed Action is minimal.

#### *3.1.2.3 Impacts from the Operation of the Proposed Action*

MMF

There would be long-term, minor, direct, adverse impacts to land use from operation of the MMF due to the conversion of undeveloped land to developed land, rendering 16 acres no longer viable as farmland. Approximately 16 acres of agricultural land would be lost and converted to a developed land use.

Voelz Gate ACP

There would be long-term, minor, direct, adverse impacts to land use from the operation of the Voelz Gate ACP due to the partial conversion of undeveloped land to developed land, rendering 16 acres no longer viable as farmland.

Overall, impacts to land use from the operation of the Proposed Action (MMF and Voelz Gate ACP) are considered moderate as LEAD contains over 10,000 acres of agricultural land. When compared to the total agricultural land available at the site, the loss of a combined 32 acres due to

operation of the Proposed Action is minimal; however, it is a large loss of agricultural land in general.

#### *3.1.2.4 Impacts from the No-Action Alternative*

Overall, no impacts would occur to land use under the No-Action Alternative as there would be no change in land use at either site. The MMF site would remain in agricultural land use. The Voelz Gate ACP site would continue to function as an ACP on a portion of already developed land and the remaining acreage would continue as an agricultural land use.

## 3.2 VIEWSHED

### *3.2.1 Affected Environment*

LEMC consists of semi-improved and unimproved lands. The semi-improved lands include earthen munitions storage igloos, open burning/open detonation area in the southwest, firing range, roads, railroads, and agricultural out lease fields (row crops and pasture lands). The storage and assembly facilities are scattered in the eastern, northeastern, and southwestern areas of LEMC, but most of the built structures reside in the LEAD project area. The unimproved areas of LEMC consist of forests, streams, and wetlands. There are housing/residential developments on the Installation. However, there is no housing within LEMC. Outside the Installation, there are rural residences along the northeast border and higher density residential developments to the southeast (LEMC, 2020).

### *3.2.2 Environmental Consequences*

#### *3.2.2.1 Significance Criteria*

An alternative would be considered to have a significant effect on visual impacts if:

- Long term alteration of the viewshed that would require minimization would occur
- Negative alterations to the viewshed of a historical resource would be expected
- It is not compliant with the overall viewshed of adjacent areas

#### *3.2.2.2 Impacts from the Construction of the Proposed Action*

<u>MMF</u>
The MMF site is surrounded by tree lines on either side and would not be easily visible from other buildings at LEAD or by neighboring residents; therefore, no impacts to the viewshed are anticipated.

<u>Voelz Gate ACP</u>
The Voelz Gate ACP is along Cumberland Highway/ Pennsylvania State Route 997. This is a public, two-lane highway that connects Chambersburg to Upper Strasburg. This is a heavily used public road and construction equipment, and activity would be easily visible from this roadway; therefore, there would be short-term, minor, direct, adverse impacts to the viewshed. As the construction would be temporary, and the existing ACP would continue to be operational, adverse

impacts to the viewshed are minor and the conversion from an agricultural field to a paved parking lot, would be easily visible. However, considering there is an existing ACP and roadway, this result would have minor impacts to the viewshed.

#### *3.2.2.3 Impacts from the Operation of the Proposed Action*

MMF

Operation of the MMF would cause long-term, minor, direct, adverse impacts due to the conversion of the natural environment to hard/grey infrastructure at the MMF site; however, the area is surrounded by tree lines on all sides and is not easily visible from LEAD buildings.

Voelz Gate

Operation of the Voelz Gate ACP site would cause long-term, minor, direct, adverse impacts to the viewshed along the Cumberland Highway/ Pennsylvania State Route 997. The Proposed Action would expand the ACP by approximately 18 acres, converting farmland to impervious surfaces.

#### *3.2.2.4 Impacts from the No-Action Alternative*

Under the No Action Alternative, there would be no changes to the viewshed at either site. No trees would be removed, nor would any development occur that adds anything to the viewshed.

## 3.3 GEOLOGY, TOPOGRAPHY, AND SOILS

### *3.3.1 Affected Environment*

#### *3.3.1.1 Topography*

LEAD lies in the Appalachian Ridge and Valley physiographic region, specifically, the Susquehanna-Potomac Segment of the Middle Section of the Appalachian Ridge and Valley Region (Milner Associates, 1981), on a divide between the Susquehanna drainage flowing northward and the Potomac drainage flowing southward (Shippensburg University 1995). The extreme western portion of the depot crosscuts Broad Mountain, and the remainder of LEAD is contained by the Cumberland Valley, where elevations typically vary between 700 feet (ft) above mean sea level (amsl) and 730 ft (John Milner Associates 1981). The Cumberland Valley trends northeast to southwest through central Pennsylvania and is bordered to the west by the Appalachian Mountains. The South Mountain section of the Blue Ridge Province is east of Chambersburg and marks the eastern edge of the Cumberland Valley.

The topography of the Proposed Action area ranges from approximately 800 ft amsl to 900 ft amsl **(Figure 3-2**). The MMF site is highest in the center, with gentle slopes to the north and south. The Voelz Gate ACP is highest at the center point with gentle slopes to the south/southeast.

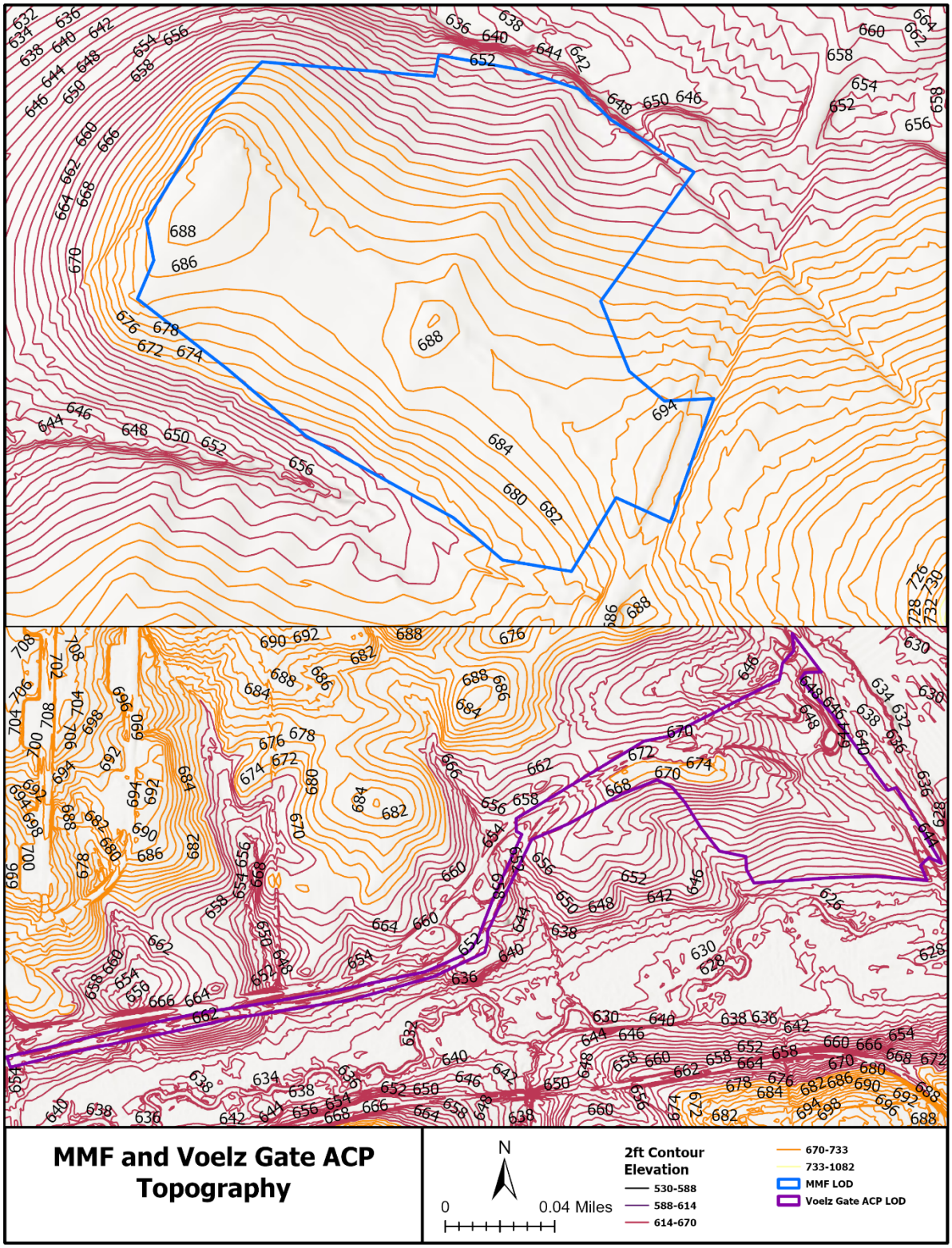


***Figure 3-2: Topography in the Proposed Action Areas***

### *3.3.1.2 Geology*

LEAD straddles two major geologic structural features: the South Mountain Anticlinorium to the east and the Massanutten Synclinorium to the west. The eastern section of the depot is underlain primarily by carbonate rocks (limestones and dolomites) and is part of the South Mountain Anticlinorium. The western section of the depot is underlain primarily by shales and is part of the Massanutten Synclinorium. These regional geologic structures were formed as a result of folding that occurred during the Paleozoic era (225 million to 570 million years ago). In the eastern section of the depot, high-angle reverse faulting accompanied the folding. As a result, several major faults, which strike north to northeast and dip to the southeast at fairly steep angles, occur on the depot (Weston, 1996). The Letterkenny Fault, which dips to the west; the Pinola Fault, which dips to the east and is to the west of the Letterkenny Fault; and an unnamed fault, which occurs between the Pinola and Letterkenny Faults; all occur in the excess area.

The depot is underlain by five Ordivician-aged geologic formations (430 million to 500 million years old) of the Great Valley. The formations underlying the depot include carbonate rocks of the Chambersburg formation, St. Paul Group, Rockdale Run formation, and Pinesburg Station formation and the shales and sandstones of the Martinsburg formation (Tetra, 2020). Based on the soil associations of the Proposed Action, which contain sandstone, siltstone, and sandstone parent material, it is likely the LODs fall within the Martinsburg Formation area.

The Martinsburg formation is late Ordivician in age and consists of thin-bedded, black, steeply inclined, extensively fractured shales. The formation contains interbedded layers of sandstones, siltstones, and some carbonates. The Martinsburg formation is more resistant to erosion than the limestones and dolomites of the St. Paul Group and Chambersburg formation and forms the gently rolling hills of the depot.

### *3.3.1.3 Soils*

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) has mapped eight distinct soil types within the study area (**Figure 3-3)**. In general, The Weikert-Berks-Beddington soil association covers most of LEAD. Characterized as shallow to deep and well-drained, these acidic soils are weathered from shale, siltstone, and acid sandstone.

MMF

The MMF consists of six (6) soils listed in **Table 3-1**, one of which is hydric. The hydric soil is a Brinkerton silt loams, 3 to 8 % slope. These soils are found on the outskirts of the LOD to the south, where there are streams and/or wetlands that would not be disturbed by the Proposed Action.

Voelz Gate ACP

The Voelz Gate ACP LOD mainly contains Berks channery silt loam, 3 to 8 % slopes. Approximately 0.4 acres within the LOD is considered hydric and poorly drained, Brinkerton silt loam.

None of the soils within the Proposed Action site are considered highly erodible.

***Table 3-1: Soils within the Proposed Action Areas***

| MMF LOD | | | | | |
|---|---|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in LOD** | **Percent of LOD** | **Hydric** | **Drainage Class** |
| BkB | Berks channery silt loam, 3 to 8 % slopes | 7.2 | 43.8 | No | Well Drained |
| BrB | Brinkerton silt loam, 3 to 8 percent slopes | 0.1 | 0.5 | Yes | Poorly Drained |
| WkB | Weikert very channery silt loam, 3% to 8% slopes | 5.8 | 35.1 | No | Somewhat excessively drained |
| WkC | Weikert very channery silt loam, 8% to 15% slopes | 2.2 | 13.1 | No | Somewhat excessively drained |
| WkD | Weikert very channery silt loam, 15% to 25% slopes | 1.2 | 7.6 | No | Somewhat excessively drained |
| **Voelz Gate ACP LOD** | | | | | |
| **Map Unit Symbol** | **Map Unit Name** | **Acres in LOD** | **Percent of LOD** | **Hydric** | **Drainage Class** |
| As | Atkins silt loam | 0.1 | 0.3 | Yes | Poorly drained |
| BkB | Berks channery silt loam, 3% to 8 % slopes | 16.4 | 50.4 | No | Well Drained |
| BrB | Brinkerton silt loam, 3% to 8% slopes | 1.9 | 5.8 | Yes | Poorly drained |
| CtB | Clearbrook channery silt loam, 0 to 8 percent slopes | 0.1 | 0.1 | No | Somewhat poorly drained |
| ErB | Ernest silt loam, 3 to 8 percent slopes | 0.1 | 0.5 | No | Moderately well drained |
| WeB | Weikert channery silt loam, 3 to 8 % slopes | 10 | 30.8 | No | Somewhat excessively drained |
| WkB | Weikert very channery silt loam, 3% to 8% slopes | 3.8 | 11.8 | No | Somewhat excessively drained |

*Source: USDA NRCS, 2025*

### *3.3.2 Environmental Consequences*

#### *3.3.2.1 Significance Criteria*

Impacts to topography, geology, and soils would be considered significant if the construction and operation of the Proposed Action:

- alters the topography of the surrounding area
- removes or alters bedrock resulting in structural instability to surrounding buildings or infrastructure
- cause substantial soil erosion or loss of topsoil, which would result in damage to waterways, ground instability, or impacts to animal or human habitats

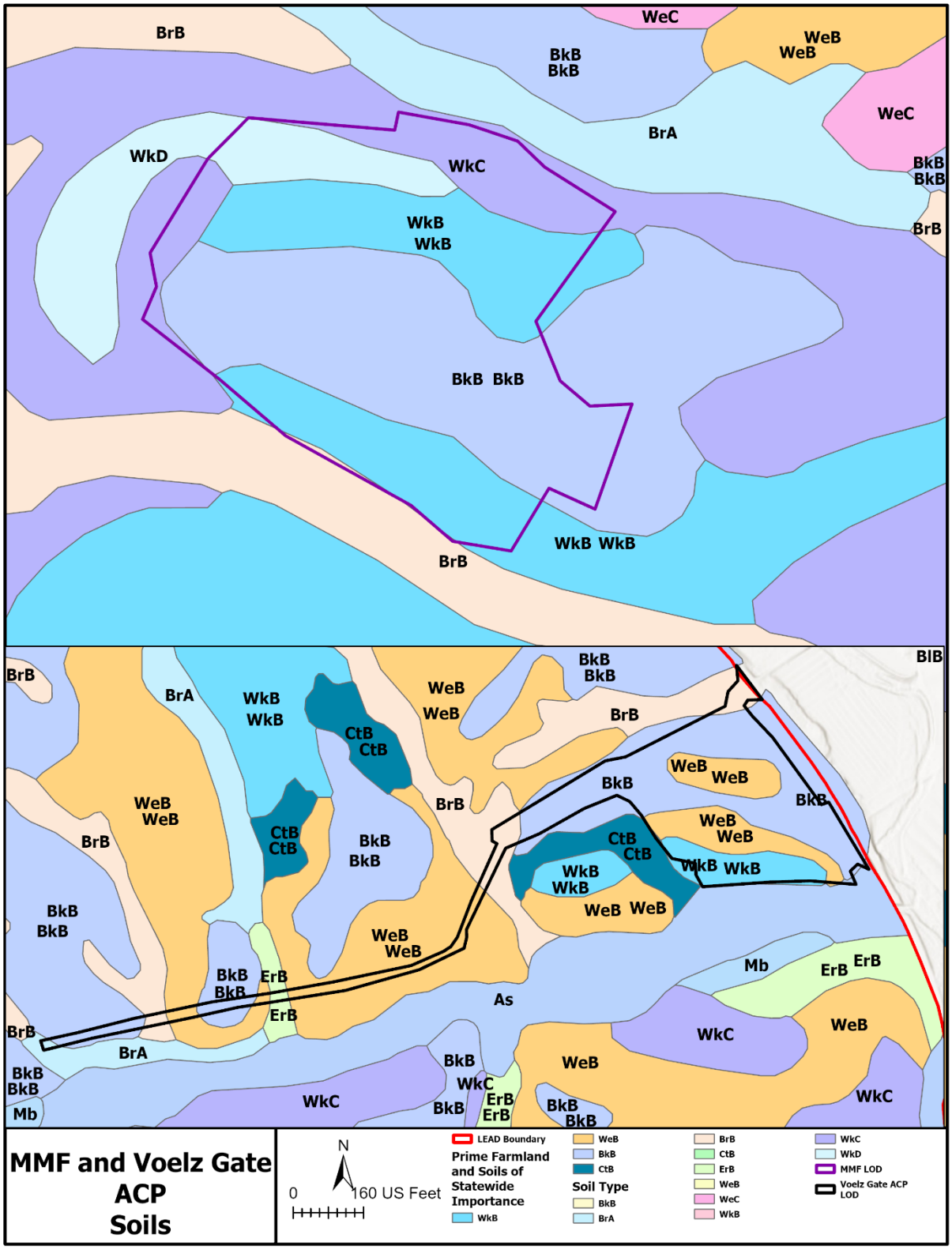


*Figure 3-3: Soils of the Proposed Action Area*

### *3.3.2.2 Impacts from Construction of the Proposed Action*

**Topography**

MMF

There would be a short-term, minor, direct, adverse construction impacts on topography at the MMF site. Moderate grading would be required. The site has gentle, rolling hills, with peak elevation occurring in the center of the agricultural field and downward slopes towards the north and south.

Voelz Gate ACP

There would be a short-term, minor, direct, adverse construction impacts on topography at the Voelz Gate ACP site. Some grading would be required at the site.

**Geology**

There would be no bedrock blasting or impacts to bedrock outcrops during the construction of the Proposed Action that would impact the geology of LEAD.

**Soils**

Proper construction management and planning and the use of appropriate best management practices (BMPs) for controlling runoff, erosion, and sedimentation during construction activities, would minimize adverse impacts to soils. Erosion and sediment controls, including a stabilized construction entrance, silt fencing, earth dikes and/or diversion fencing, and sediment traps, would be installed during construction. Areas disturbed outside of the new construction footprints would be reseeded, replanted, and/or re-sodded following construction activities, decreasing the overall erosion potential of the site and improving soil productivity.

As the Proposed Action would disturb more than one acre of ground surface, either a General or Individual Permit for Stormwater Associated with Construction Activity would be applied for with the Pennsylvania Department of Environmental Protection (PADEP). Additionally, the Proposed Action would disturb more than five acres of land; therefore, an Erosion and Sediment Permit is required as well. The contractor or organization would prepare and apply for these permits on behalf of LEAD to the PADEP for review and approval prior to the start of any construction activities. In addition, the project would follow the PADEP Erosion and Sediment Pollution Control Program Manual. Additional soil erosion environmental protection measures may also be required in the associated state-issued construction permit (e.g., the National Pollutant Discharge Elimination System [NPDES] permit).

MMF

The MMF site is an active agricultural field; therefore, the soil structure has been previously altered; however, the soil structure remains in prime condition for farming. The construction of the MMF would have short- and long-term, moderate, direct, adverse impacts on soils at the site. Ground-disturbing activities would include vegetation and topsoil removal, the removal of mature forest, and grading. Soils would be compacted, and soil layer structure would be disturbed and modified. Exposed soils would be susceptible to wind and surface runoff, which may lead to

erosion and additional loss of soil. MMF construction would prevent any future agricultural use of the field.

Additionally, the soils in the forested portions of the LOD would be highly disturbed. The removal of trees and their roots would break soil structure and leave the area vulnerable to erosion. As the proposed LOD is large, over 30,000 SF, and the soils on which it would be placed are a productive farm field to be converted to impervious surface, these would suffer the greatest adverse impacts from construction.

Voelz Gate ACP

The Voelz Gate ACP has disturbed soils from previous development of the existing ACP. The undeveloped portion in is an active agricultural field; therefore, the soil structure has been previously altered; however, the soil structure remains in prime condition for farming. The construction of the Voelz Gate ACP would have short- and long-term, moderate, direct, adverse impacts on soils at the site. Ground-disturbing activities would include vegetation and topsoil removal, the removal of mature forest, and grading. Soils would be compacted, and soil layer structure would be disturbed and modified. Exposed soils would be susceptible to wind and surface runoff, which may lead to erosion and additional loss of soil. Voelz Gate ACP construction would prevent any future agricultural use of the field.

#### *3.3.2.3 Impacts from Operation of the Proposed Action*

The operation of the Proposed Action, the MMF and Voelz Gate ACP, would be stabilized with the planned development and landscaping at project sites. The operation of these facilities would not affect topography or geology. There would be no bedrock blasting or impacts to bedrock outcrops during either the operation of the proposed MMF and Voelz Gate ACP would impact the geology of LEAD.

**Soils**

The operation of the Proposed Action would lead to long-term, moderate, direct, adverse impacts to soils due to construction of the Proposed Action. These soils, including soils of statewide importance would be permanently converted into non-productive and compacted soils.

#### *3.3.2.4 Impacts from the No Action Alternative*

Implementation of the No Action Alternative would have no impacts on topography, geology, or soils. The MMF and Voelz Gate ACP would not be constructed, and there would be no activities that would change the topography, geology, or the existing soil quality of the site.

## 3.4 PRIME FARMLAND

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods,

including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for extended periods of time, and they either do not flood frequently or are protected from flooding (USDA, 1993). In Pennsylvania, the State Rural Development Committee defines "farmland of statewide importance" for land that is not classified as prime or unique farmland, but is important for the production of food, feed, fiber, forage, or oilseed crops.

### *3.4.1 Affected Environment*

LEAD contains over 10,000 acres of land classified as agricultural tracts and could be used for farmland. According to the 2020 LEAD Integrated Natural Resource Management Plan (INRMP) LEAD contains 1,442 acres of soils that are federally considered prime farmland soils and 9,969 acres of soils that are considered of statewide importance **(Figure 3-4**).

MMF

The proposed MMF contains two soils of statewide importance, listed in **Table 3-2** below (USDA, 2022). The total MMF LOD is 16 acres; therefore, approximately 50% of the MMF LOD contains soils of statewide importance.

***Table 3-2: MMF LOD Soils of Statewide Importance***

| Map Unit Symbol | Map Unit Name | Acres in LOD |
|---|---|---|
| BkB | Berks channery silt loam, 3 to 8 % slope | 7.2 |
| WkB | Wurtsboro channery loam, 3 to 8% slopes | 5.8 |
| **Total** | | **13.0** |

Voelz Gate ACP

The proposed ACP contains four soils of statewide importance listed in **Table 3-3**. A total of 30.4 acres of the proposed ACP are soils of statewide importance; however, only approximately 13 acres are currently farmed, while the remaining acreage is previously developed land for the existing ACP.

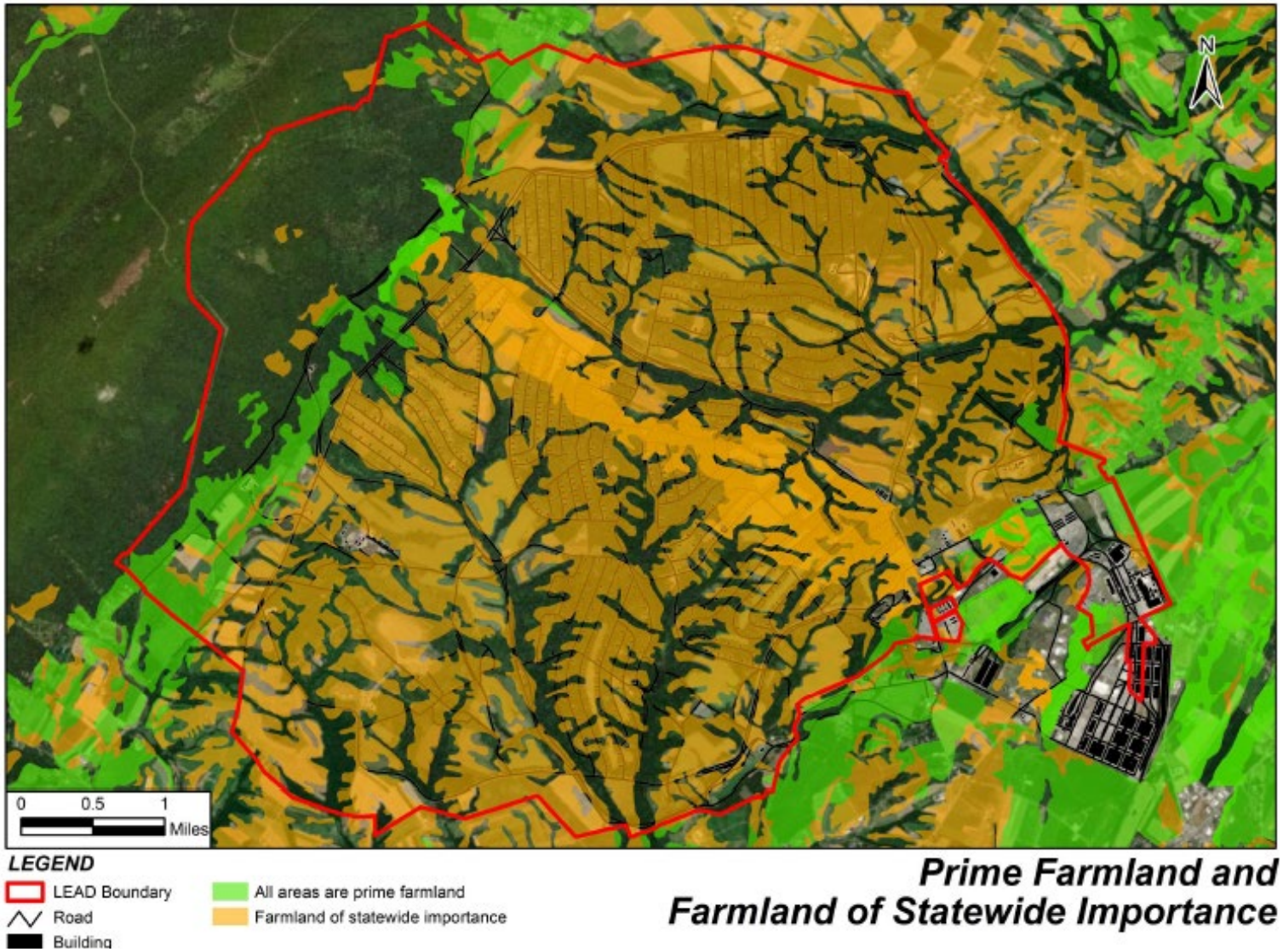


***Figure 3-4: Prime Farmland and Farmland of Statewide Importance at LEAD***

*Table 3-3: Voelz Gate ACP LOD Soils of Statewide Importance*

| Map Unit Symbol | Map Unit Name | Acres in LOD |
|---|---|---|
| BkB | Berks channery silt loam, 3 to 8 % slopes | 16.4 |
| CtB | Clearbrook channery silt loam, 0 to 8 % slopes | 0.1 |
| ErB | Ernest silt loam, 3 to 8 percent slopes | 0.1 |
| WeB | Weikert channery silt loam, 3 to 8 % slopes | 10 |
| WkB | Weikert very channery silt loam, 3 to 8 % slopes | 3.8 |
| **Total** | | **30.4** |

### *3.4.2 Environmental Consequences*

#### *3.4.2.1 Significance Criteria*

Impacts to prime farmland would be considered significant if the construction and operation of the Proposed Action would convert a large percentage of LEAD land that is currently eligible to be used as farmland to another land use and if this conversion is irreversible.

#### *3.4.2.2 Impacts from the Construction of the Proposed Action*

Under the Proposed Action, there would be long-term, moderate, direct, adverse impacts from the construction of the Proposed Action.

MMF

The proposed MMF would convert 13 acres of previously undisturbed prime farmland soil of statewide significance to compacted and disturbed soils. After the construction of the MMF, the soils would not be eligible to be used as farmland again due to compaction. The majority of these soils are currently being used as farmland soils. The entire field on which the proposed MMF sits is active farmland; however, there of over 10,000 acres of eligible farmland on LEAD. The farmland lost through the Proposed Action could be replaced elsewhere at LEAD and represents less than 1% of eligible farmland at LEAD.

Voelz Gate ACP

The proposed ACP would convert 15 acres of previously undisturbed prime farmland soils to disturbed and compacted soils. The existing ACP and roadway, spans 17 acres of the proposed site. These soils are compacted and disturbed; therefore, less than the estimated acres of soils of statewide importance would be disturbed. After the construction of the ACP, the soils would not be eligible to be used as farmland again due to compaction. The majority of these soils are currently being used as farmland soils. More than half of the proposed acreage for the new ACP is active farmland; however, there of over 10,000 acres of eligible farmland on LEAD. The farmland lost

through the Proposed Action could be replaced elsewhere at LEAD and represents less than 1% of eligible farmland at LEAD (**Figure 3-4**).

#### *3.4.2.3 Impacts from the Operation of the Proposed Action*

The operation of the Proposed Action would have minor, direct, long-term, adverse impacts on prime farmland soils.

MMF

The conversion of prime farmland for the proposed MMF would result in permanent loss of farmland. MMF operations may continue to compact these soils further and create soils that could no longer be used as farmland.

Voelz Gate ACP

The conversion of prime farmland for the proposed Voelz Gate ACP would result in permanent loss of 15 acres of farmland. The operations of the proposed ACP may continue to compact these soils.

#### *3.4.2.4 Impacts from the No Action Alternative*

The No Action Alternative would have no impacts of prime farmland. Under the No Action Alternative, no prime farmland soils would be impacted, and the current prime farmland would continue to be farmed. The existing ACP would continue to serve as the main access point for commercial deliveries, and the PrSM mission would not proceed at LEAD; therefore, no prime farmland would be disturbed.

## 3.5 WATER RESOURCES

Water resources are defined as sources of water available for use by humans, flora, or fauna, including surface water, groundwater, near-shore waters, wetlands, and floodplains. Water resources are broken down into the groups below, each of which is defined individually.

### *3.5.1 Affected Environment*

#### *3.5.1.1 Surface Water*

Surface water resources, including but not limited to, storm water, ponds, lakes, streams, rivers, and wetlands, are important for economic, ecological, recreational, and human health reasons. Year-round presence of water in surface water features varies, falling into the categories of perennial, intermittent, and ephemeral. Perennial surface waters normally have water year-round. Intermittent surface waters flow only when they receive water from rainfall or springs, or from some surface sources such as melting snow. Ephemeral surface waters flow in direct response to precipitation; they receive little to no water from springs, melting snow, or other source and its channel is over the water table at all times (USGS, 2013). Surface water systems are typically described in terms of watersheds, a land area bounded by topography that drains water to a common destination.

LEAD is a part of the Chesapeake Bay Watershed. To protect and restore this valuable ecosystem, Pennsylvania joined a consortium of state and federal agencies to establish the Chesapeake Bay Program partnership. The Army's conservation mission supports the Chesapeake Bay Programs, and LEAD is implementing BMPs that support the guidelines established by the partnership.

LEAD is directly on the drainage divide between the Susquehanna River to the northeast and Potomac River to the southwest. Because of the headwater location, drainages at LEAD are short, and streams are small. Streams cutting through the limestone terrain of the Chambersburg formation and St. Paul group on LEAD flow through broad, open valleys and are ephemeral or intermittent, carrying water only in winter and spring, or after heavy rains. In contrast to this, streams cutting through the upper shale units of the Martinsburg formation usually meander in small, steep-walled valleys and are perennial. Natural surface water features at LEAD include seven named streams and numerous unnamed streams. Lehman Run, Keasey Run (a tributary of Lehman Run), Muddy Run, and Rowe Run are in the northeastern portion of LEAD and drain to the Susquehanna River. Dennis Creek, Back Creek, Rocky Spring Branch, and Conococheague Creek are in the southwest and drain to the Potomac River. The main channels on LEAD—Lehman Run, Keasey Run, Muddy Run, and Rocky Spring Branch are permanent (Shippensburg University 1995).

The Susquehanna watershed drains 27,500 miles of land and cover parts of New York, Maryland, and Pennsylvania. Muddy Run, located in U.S. Geological Survey Susquehanna River Subregion 0205 drains approximately 11.4 square miles directly into the west branch of the Susquehanna River.

Muddy Run watershed is primarily surrounded by agricultural lands. Pastures and croplands often extend right up to streambanks with little to no riparian buffer zones. Livestock frequently have unlimited access to streambanks throughout the watershed. Streambank erosion is severe in most reaches of the stream. Small riparian buffers and streambank erosion create sedimentation issues for the watershed. Targeted total maximum daily load (TMDLs) for Muddy Run is 7,053.5710 pounds of sediment per day. A TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant. The mean annual loading of sediment to Muddy Run Watershed was 10,453.41 pounds per day in 2012 (DEP, 2012).

The Potomac River Watershed drains approximately 14,670 square miles in four different states (Virginia, Maryland, Pennsylvania, West Virginia, as well as and Washington D.C.) (Interstate, 2025). Dennis Creek is located in the Potomac Creek Watershed, sub watershed Conococheague-Opequon HUC 02070004 or subbasin 13C. Dennis Creek drains approximately 13.2 square miles and is primarily surrounded by agricultural land. Streambank erosion is one of the main concerns for the area; however, there are no corrective plans for water quality of the stream.

The proposed Voelz Gate ACP has an unnamed tributary running west to east along its northern boundary. This unnamed tributary flows into Muddy Run to the north, off site. There are three other tributaries of Muddy Run that flow under the northern road boundary of the site through culverts. These run north to south. Muddy Run also borders the LOD to the south. The proposed MMF site contains one unnamed tributary that runs east to west, flowing along the northern

boundary of the LOD. The unnamed tributary flows into Dennis Creek, which empties into Conococheague Creek to the south.

#### *3.5.1.2 Floodplains*

Floodplains are defined as relatively flat areas adjacent to rivers, streams, watercourses, bays, or other bodies of water subject to inundations during flood events. The likelihood of these flood events is categorized by Federal Emergency Management Agency (FEMA). The 100-year floodplain has a 0.1% change of flooding each year and is considered a flood hazard.

The proposed Voelz Gate ACP is within FEMA flood map area 42055C0167E, effective January 18, 2012. The proposed MMF is located in FEMA flood map area 42055C0165E, effective January 18, 2012. These maps indicate that the proposed MMF and Voelz Gate ACP are entirely within Zone X, defined as an area determined to be outside of the 500-year flood and protected by levee from 100-year flood (**Figure 3-5)**.

#### *3.5.1.3 Wetlands*

Wetlands are protected under the Clean Water Act (CWA). Jurisdictional wetlands are those wetlands subject to regulatory protection under Section 404 of the CWA and EO 11990 *Protection of Wetlands*.

The U.S. Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated with 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). Important wetland functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, storm water attenuation and storage, sediment detention, and erosion protection. If a formal wetland delineation has already been determined for the Army installation for the Proposed Action area, this can be used to determine the occurrence of jurisdictional wetlands or other regulated Waters of the U.S. within the footprint of the construction area for any proposed new facilities and associated infrastructure.

Pennsylvania Code 25 § 102.14. *Riparian Buffer Requirements* mandates buffers for any projects that fall within a "high quality" or "exceptional value" watershed, which is determined by the PADEP water quality testing. LEAD has not undergone a comprehensive wetland delineation to quantify the acreage of wetlands present on the installation or the quality. Wetland delineations are performed on an as-needed basis for specific projects. However, LEAD is the headwaters for Muddy Run, and therefore has many small streams associated with it. The southern half of LEAD has streams associated with Rocky Spring Branch.

The proposed MMF site has two wetlands on its northern border, visible in **Figure 3-6**.Wetland 1 is a Palustrine Emergent (PEM) Wetland that totals approximately 0.7 acres and lies to the northeast of the LOD, draining west into the unnamed tributary connecting Wetlands 1 and 2. Wetland 2 is a PEM wetland of approximately 0.38 acres and drain wests into the unnamed tributary. Both wetlands are regulated by the PADEP as well as USACE since they are not isolated.

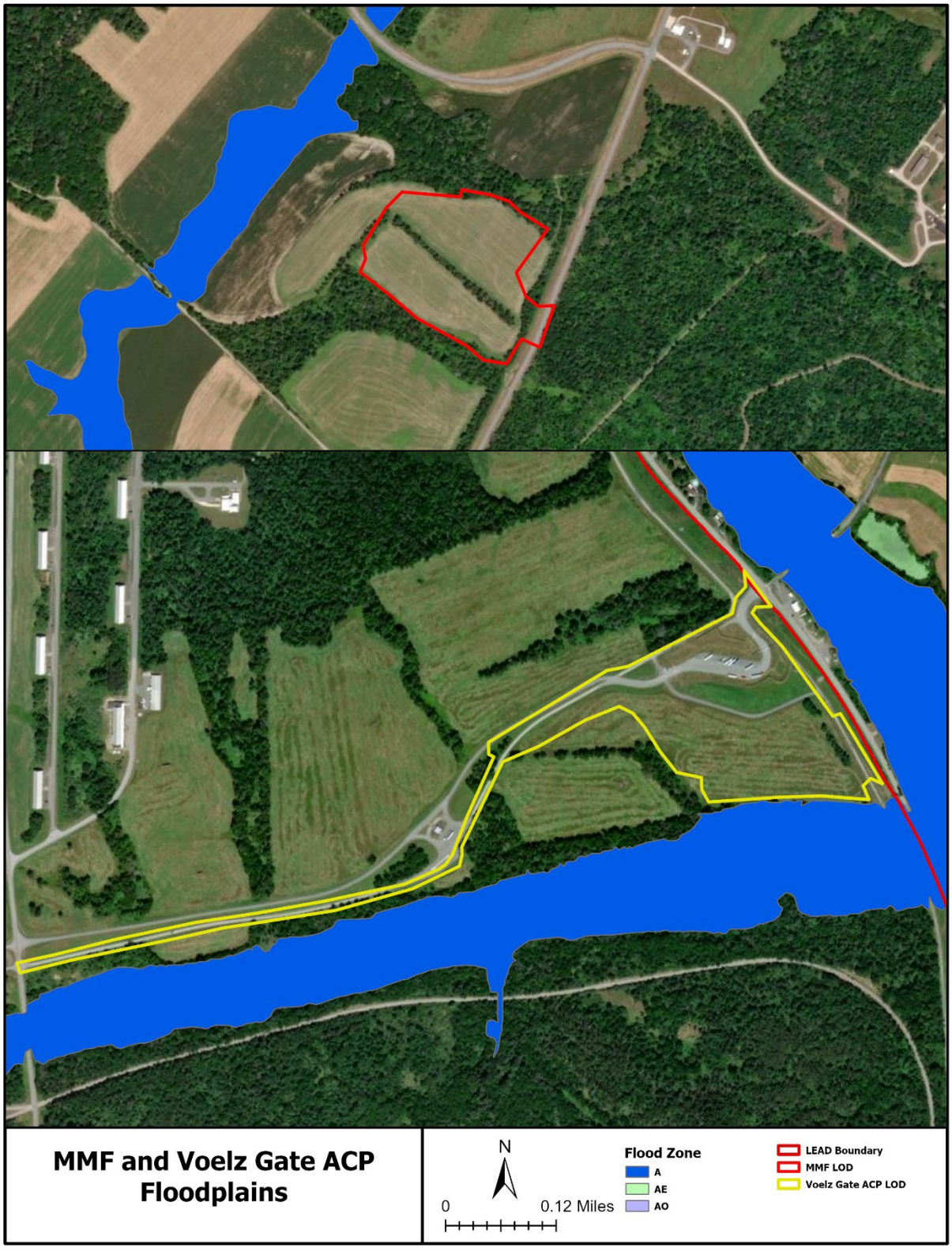


***Figure 3-5: Floodplains at the MMF and Voelz Gate ACP Proposed Action Site***

The proposed Voelz Gate ACP does not contain any wetlands within its LOD; however, there are two wetlands just outside of its boundaries. The first wetland is to the north of LOD and connecting to an unnamed tributary. This wetland is a PEM wetland spanning approximately 0.09 acres. The second wetland is a large wetland surrounding Muddy Run to the south of the LOD. This is a palustrine forested (PFO) wetland (**Figure 3-7**). Only the northern boundary of the wetland was confirmed by USACE for purposes of the Proposed Action.

#### *3.5.1.4 Groundwater*

Groundwater is classified as any source of water beneath the ground surface and may be used for potable water, agricultural irrigation, and industrial applications. Near-shore waters can be directly affected by human activity and are important for human recreation and subsistence.

LEAD is largely underlain by shales and some graywacke (Martinsburg formation), although carbonate rocks (limestone) do occur in the Rowe and Conococheague drainages and in a narrow belt along the base of Broad Mountain. The Martinsburg formation is generally a good aquifer yielding water of decent quality, although high iron and manganese concentrations can occur. Hydrogen sulfide gas occasionally occurs and degrades the water quality. Sustained well yields of 100 gallons per minute can be expected, though there is a close relationship between well yield and topography. Wells in the area of low topographic expression have significantly greater yields than wells on upland locations. Geologically, wells along fracture traces also have higher yields. Yield from the carbonate aquifers also is directly related to topographic expression and fracture trace occurrence. Secondary porosity in the carbonate due to solution activity is important and results in a wide range of yield from 0.01 to 950 gallons per minute. Good locations in the Saint Paul group will yield 150 to 200 gallons per minute, but the Chambersburg formation produces only about 40 gallons per minute. Calcium and magnesium deposits can occur from carbonate aquifers, making this water unsuitable for certain industrial uses (Shippensburg University 1995).

Groundwater is not used as a resource at LEAD as the reservoir off-base is used for drinking water. Suez Water Pennsylvania Incorporated through the Franklin County General Authority supplies, owns, and maintains the water on LEAD. Three primary water lines supply LEAD, two of which extend off the water main.

#### *3.5.1.5 Stormwater*

LEAD has a large amount of impervious surface, generally flat terrain, and a high clay loam content/low permeability of soils. As a result, stormwater drainage can be an issue at LEAD (USACE, 2020).

The proposed MMF site currently contains no stormwater features as it is an active agricultural field that is undeveloped. Its natural topography drains water to the northwest and south end of the site with the high point in elevation being in the center and eastern portion of the site

The proposed Voelz Gate site has a culvert stormwater management system to allow for water to flow underneath roads. The majority of the developed site drains to an existing stormwater management basin which discharges at grade through an outlet structure and outfall pipe. The remainder of the site drains to a forested swale northwest. There is one culvert on the northeast

end of the site that conveys and unnamed tributary (WUS 1) to the east under a roadway. There is a culvert that conveys Muddy Run (WUS 3) to the east underneath a road. This is just south of the LOD boundary.

## Energy Independence and Security Act of 2007

Army stormwater management practices are also required to comply with Section 438 of the Energy Independence and Security Act (EISA) of 2007, which directs federal agencies sponsoring development or redevelopment of over 5,000 SF in size to use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of water flow. This requirement is further emphasized by Army policy which states development projects of 5,000 SF (1,524 square meters) or greater must be planned, designed, and constructed to manage any increase in stormwater runoff (i.e., the difference between pre- and post-project runoff) within the LOD.

## Municipal Separate Storm Sewer System Phase II

Section 402(p) of the CWA addresses the unique permitting needs for Municipal Separate Storm Sewer System (MS4s) under NPDES. The USEPA's first National Pollution Discharge Elimination System (NPDES) regulation, finalized in 1973, recognized the challenges of regulating stormwater under the CWA and exempted most stormwater discharges from the NPDES permit requirement. In 1977, a federal court ordered the USEPA to develop permitting regulations for stormwater discharges. Congress, in 1987, stepped in and added Section 402(p) to the CWA to create a distinct permitting standard for MS4s.

Section 301 of the CWA generally mandates that NPDES permits include water quality-based effluent limits that are as stringent as necessary to ensure that permittees' discharges comply with all applicable water quality standards. Section 402(p) exempts MS4 permits from this requirement and replaces it with a unique standard; MS4 permittees must "reduce the discharge of pollutants to the maximum extent practicable.

PADEP oversees the implementation of MS4 regulations and permits in Pennsylvania. MS4 permits require the permitholder to reduce the discharge of pollutants to the maximum extent practicable. LEAD would also comply with the MS4 Phase II State and Federal permit which obligates minimum control measures for construction and post-construction runoff control.

## General Construction Permit

As part of the process to obtain the construction general permit for stormwater discharges during construction, the construction contractor would prepare a Stormwater Pollution Prevention Plan (SWPPP). SWPPPs include implementation of BMPs, performing frequent visual inspections, and conducting benchmark monitoring to determine BMP effectiveness. Monitoring results are analyzed in relationship to the identified water quality objectives and if the benchmarks are not being reached, the BMPs would be modified.

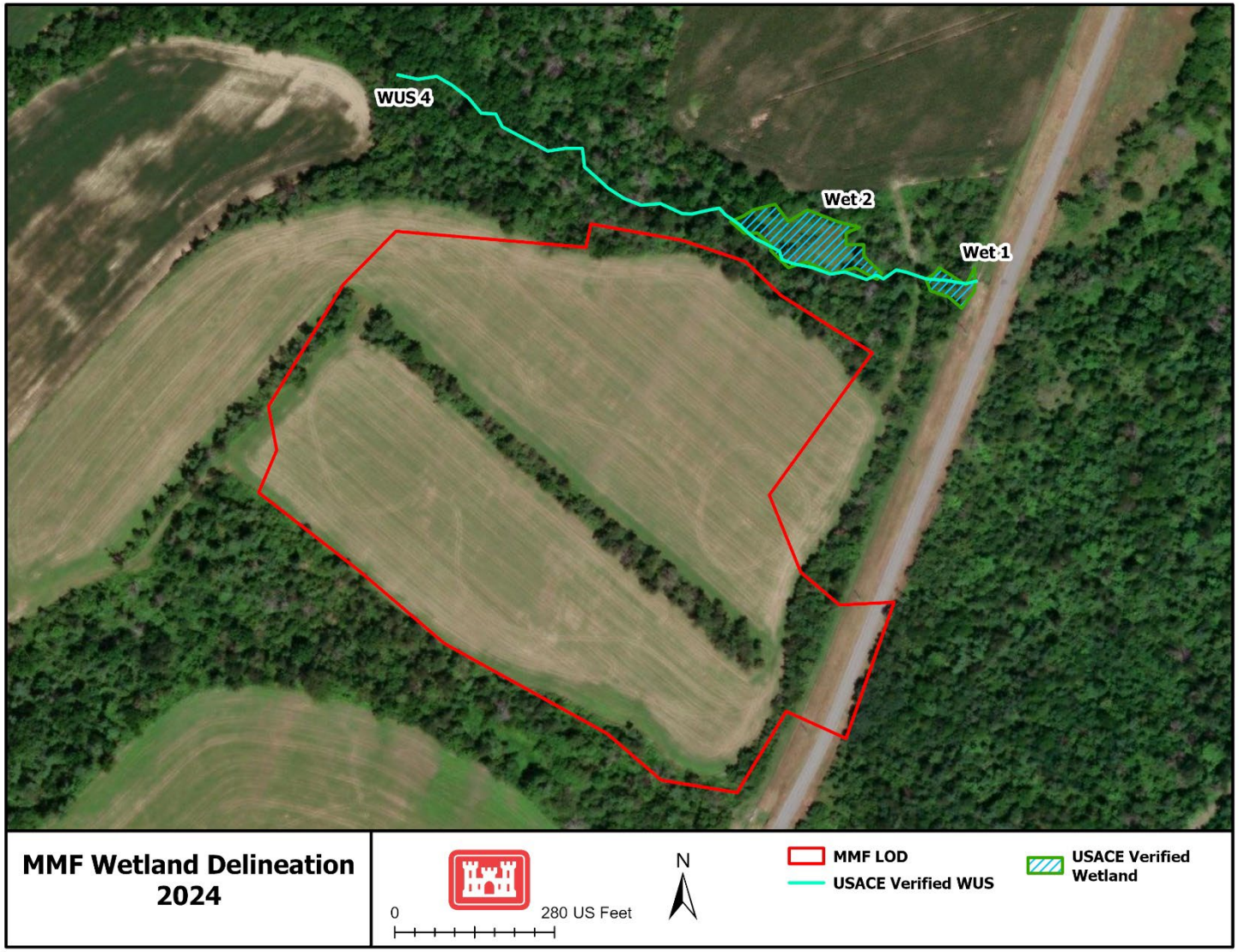


***Figure 3-6: Surface Waters of MMF Proposed Action Area***

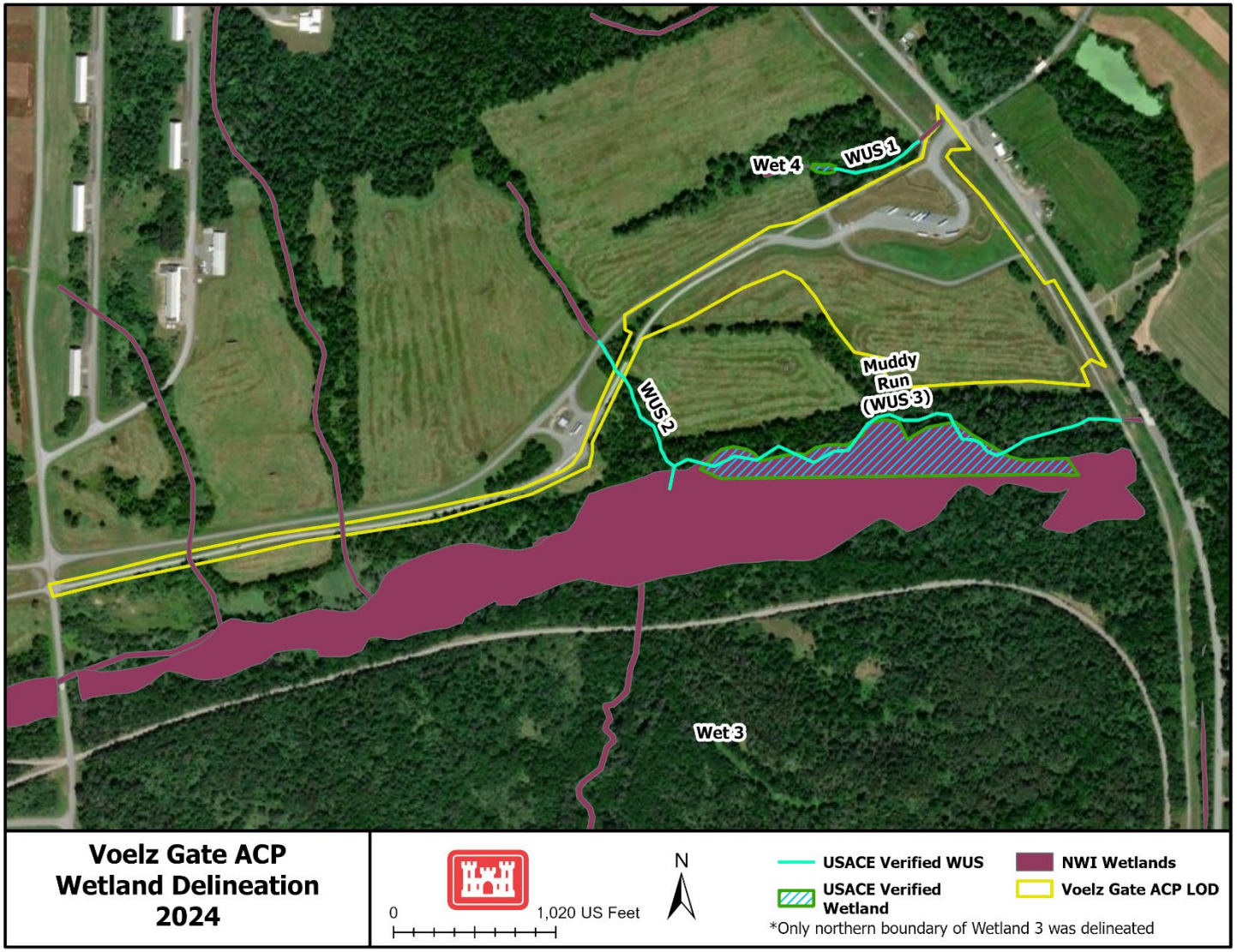


***Figure 3-7: Surface Waters at Voelz Gate ACP***

### *3.5.2 Environmental Consequences*

#### *3.5.2.1 Significance Criteria*

The general definitions of what defines significant impacts for each resources area are stated below.

**Water Resources**: Impacts to water resources would be considered significant if impacts:

- Substantially deplete groundwater supplies or interfere with groundwater recharge
- Result in a violation of federal and/or state water quality standards
- Cause an unpermitted direct impact on a Water of the U.S.
- Alter existing drainage patterns

**Floodplains**: Impacts to floodplains would be considered significant if impacts

- Threaten or damage unique hydrologic characteristics
- Endanger public health by creating or worsening health hazard conditions
- Violate established laws or regulations adopted to protect floodplains

**Wetlands**: Impacts to wetlands would be considered significant if impacts:

- Fill or alter a portion of a wetland that would cause irreversible negative impacts to a species or habitat of high concern
- Irreversibly degrade the quality of a unique or pristine wetland
- Reduce population size or distribution of species of high concern

**Groundwater**: Impacts to groundwater would be considered significant if impacts:

- Reduce water availability or supply to existing users
- Overdraft groundwater basins
- Endanger public health by creating or worsening health hazard conditions

#### *3.5.2.2 Impacts from Construction of the Proposed Action*

**Surface Water**

Construction of the Proposed Action would result in short-term, minor, direct, adverse impacts to surface water. This impact could occur if sediment-laden stormwater migrated to Muddy Run. During the design of the project, appropriate BMPs would be developed and LEAD or the construction contractor would obtain the necessary permits. The three unnamed tributaries could be temporarily disturbed with digging for expanded utility lines. These impacts would be temporary and only would occur at a cross-section of the streams of under 5 ft.

Where possible, the designs would be developed to avoid or minimize impacts to surface water resources. Provided that a construction general permit for stormwater has been approved and implemented, runoff of stormwater and pollutants from a construction site is considered to be in compliance with regulatory requirements and would not cause an impairment of surface waters.

At the MMF site, a net increase of over 1.5 acres of impervious surfaces would occur. Conveyance channels along with two infiltration basins are proposed to manage stormwater runoff from the site. During construction, one infiltration basin will be used as a sediment basin and the other will be used as an embankment sediment trap to manage sediment laden runoff from construction activities. LID and green infrastructure techniques are being utilized for stormwater management, including infiltration areas. To earn points for the LEED Rainwater Management credit, the MMF is targeting onsite retainment of the 90th percentile of rainfall events. The following BMPs would be utilized to reduce erosion at the MMF site and Voelz Gate ACP:

- Temporary Grasses
- Compost Filter Sock
- Rock Construction Entrances
- Erosion Control Blanket
- Pumped Water Filter Bag (if needed)
- Rock Filters
- Tracking Slopes
- Sediment Trap
- Sediment Basins

With the implementation of permit-related construction BMPs, no construction-related stormwater runoff is expected to intersect with the Muddy Run at any time during construction or operation of the Proposed Action; however, this is still a possibility and therefore a minor adverse effect.

**Stormwater**

Construction of the Proposed Action could result in short-term, minor, direct, adverse impacts to stormwater. Over 1.5 acres of the Proposed Action sites would change from permeable to impervious surfaces which would increase the volume and quantity of stormwater runoff from the site. In accordance with 25 Pa. Code Chapter 102, pre-project and post-project runoff rates for the 1-year, 2-year, 5-year, 10-year, 25-year, 50-year storm and 100-year storms were evaluated using the NRCS TR-55 Method will be evaluated. Disturbed areas required for construction (cut/fill slopes) will be restored and seeded with a native seed mixture appropriate for the soil conditions while maintaining pre-construction drainage patterns and contours to the maximum extent feasible.

As part of the process to obtain the construction general permit for storm water discharges during construction, a SWPPP would be prepared. SWPPPs include implementation of BMPs, performing frequent visual inspections, and conducting benchmark monitoring to determine BMP effectiveness. Monitoring results are analyzed in relationship to the identified water quality objectives and if the benchmarks are not being reached, the BMPs would be modified. These measures would ensure that construction-related impacts to stormwater quality remain at a short-term, direct, minor adverse level. With the implementation of BMPs, runoff would be minimized; but cannot be eliminated with the increase in impervious surface area.

**Floodplains**

The proposed MMF and Voelz Gate ACP sites are outside of the 100-year floodplain and would incur no adverse effects to floodplains. To address flooding risk, the project site has been designed to control peak flow rates and reduce the volume of runoff discharged to receiving waters up to

the 100-year storm event. This will help mitigate the risk of flooding during heavy rainfall events for the site and any downstream properties.

The Proposed Action would have no adverse effects on floodplains since neither of the project areas area are located within a floodplain.

**Wetlands**

There would be minor, indirect, long-term, adverse impacts to wetland resources as a result of the construction of the Proposed Action. The proposed MMF and Voelz Gate designs do not intersect wetlands but do come within 100 feet of wetlands. This would likely have a minor impact through erosion, changes in hydrology, and removal of vegetation.

The proposed Voelz Gate ACP site is bordered by a large, PFO wetland, originating from Muddy Run just south of the LOD. Muddy Run is not considered to be of "exceptional value or high quality" according to the PADEP 2022 Integrated Report Mapping. According to Pennsylvania Code 25§ 102.14, *Riparian Buffer Requirements*, these wetlands would not require riparian buffers. Wetland impacts would not require mitigation per the PADEP *General Water Obstruction and Encroachment Permit* guidelines. No wetlands would touch the project LOD.

**Groundwater**

The Proposed Action construction activities could have a short-term, indirect, negligible, adverse impacts on groundwater quality. Although construction would not directly impact or encounter groundwater resources, during construction, accidental releases of petroleum-based fluids from construction equipment could occur. If not immediately remediated, it could adversely impact groundwater quality. To avoid such potential releases and impacts, construction equipment would be properly maintained in good working order and equipped with emergency spill kits, with workers trained in proper deployment and use of these kits. This would ensure that construction contractors are prepared to respond to an emergency release of petroleum-based fluids, contain the release, and prevent adverse impacts to groundwater from occurring. Additionally, construction equipment would be refueled in a designated area equipped with impervious surfaces to avoid potential releases to permeable surfaces and the underlying groundwater.

### *3.5.2.3 Impacts from Operation of the Proposed Action*

**Surface Water**

Operations of the Proposed Action would result in negligible, long-term, negligible, direct adverse impacts to surface waters located within the vicinity of the site. The conversion of permeable to impervious areas would come mostly from the MMF building footprint. Through the use of BMPs and LID practices, LEAD would comply with Section 438 of EISA, to ensure that both pre-and post-hydrology remain the same as much as possible.

**Stormwater**

Operation of the Proposed Action would have a long-term, minor, direct, adverse impacts to stormwater. Stormwater would be treated on site at the proposed BMPs. Infiltration drainages at the MMF site would be used to reduce runoff and increase infiltration at the site. Two infiltration

drainages are proposed at the MMF site, one at the northeast end and one at the southeast end. These drainages should ensure pre-operational runoff to be upheld. In addition, PADEP and Franklin County stormwater requirements would be met. The Voelz Gate ACP would utilize stormwater retention ponds for stormwater management.

Section 438 of EISA requires that any development or redevelopment project involving a federal facility with a footprint exceeding 5,000 SF use site planning, design, construction, and maintenance strategies to maintain or restore the pre-project hydrology of the property with regard to temperature, rate, volume and duration of flow. Compliance with these requirements would be met through the implementation of LID technologies mentioned previously, which would maintain or restore natural hydrologic functions of the site. Examples include, but are not limited to, minimizing total site impervious areas, directing building drainage to vegetative buffers, using permeable pavements where practical, and breaking up flow directions from large, paved surfaces.

**Floodplains**

The proposed MMF and Voelz Gate ACP sites are outside of the 100-year floodplain and would incur no adverse effects to floodplains.

**Wetlands**

There would be long-term, minor, indirect, adverse impacts to wetland resources as a result of the operation of the Proposed Action. The proposed MMF would not impact wetlands as the LOD does not intersect the wetlands or streams to the north and does not require a riparian buffer for the wetlands. Sediment and erosion control and stormwater BMPs would be employed to prevent as much indirect impacts to wetlands as possible in the vicinity of the site after the facilities were built.

Operation of the Voelz Gate ACP would incur no effects on wetlands.

**Groundwater**

Operation of the Proposed Action would have a long-term negligible, direct, adverse impacts on groundwater quality due to the new impervious surfaces and reduced groundwater recharge volume. Operational activities would not encounter groundwater resources and thus would have no additional adverse impact.

#### *3.5.2.4 Impacts from the No Action Alternative*

Implementation of the No Action Alternative would result in no impacts to water resources. The MMF facility would not be constructed, nor would the new Voelz Gate ACP; therefore, there would be no changes to the existing hydrology in and around the Proposed Action area.

## 3.6 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals and the habitats (e.g., wetlands, forests, and grasslands) in which they live. Protected biological resources include plant and animal species listed by Pennsylvania as rare, threatened, or endangered (RTE) or by the

USFWS as threatened or endangered. Special concern species are not afforded the same level of protection, but their presence is taken into consideration by resource agency biologists involved in reviewing projects and permit applications.

### *3.6.1 Affected Environment*

#### *3.6.1.1 Vegetation*

Approximately 34% of LEAD land is second- and third-growth forest, 52% is open fields, and 13% is developed with scattered landscaped vegetation. Woody species in the approximately 6,264 acres of forest land on the Installation are primarily of the oak-hickory association, including: red oak (*Quercus rubra*), black oak (*Q. velutina*), white oak (*Q. alba*), chestnut oak (*Q. prinus*), and various hickory species (*Carya* spp.), with lesser numbers of yellow poplar (*Liriodendron tulipifera*), white ash (*Fraxinus americana*), and red maple (*Acer rubrum*). Understory species include hawthorn (*Crataegus* spp.), redbud (*Cercis canadensis*), black haw (*Viburnum prunifolium*), hackberry (*Celtis* spp.), Tatarian honeysuckle (*Lonicera tatarica*), autumn olive (*Elaeagnus umbellata*), northern spicebush (*Lindera benzoin*), and dogwood (*Cornus racemosa*). Ground cover species include dogbane (*Apocynum* spp.), hyacinths (*Hyacinthus* spp.), clover (*Trifolium* spp.), goldenrod (*Solidago* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), wild mustard (*Brassica* spp.), broom sedge (*C. scoparia*), spring beauty (*Claytonia caroliniana*), cattail (*Typha latifolia*), raspberries and blackberries (*Rubus* spp.), wild garlic (*Allium vineale*), various grasses, Japanese barberry (*Berberis thunbergii*), burdock (*Arctium* spp.), mayapple (*Podophyllum peltatum*), and multiflora rose (*Rosa multiflora*).

Open habitat vegetation at LEAD consists of grassland fields in the agricultural outlease program. The open areas are primarily buffer areas along roadways, around munitions igloos, and field borders that also serve as fire breaks. The forest habitat on LEAD is healthy overall. The greatest threats to habitat are the spread of invasive species and deer over browse. Invasive species include tree-of-heaven (*Ailanthus altissima*), reed canary grass (*Phalaris arundinacea*), mile-a-minute (*Persicaria perfoliata*), Japanese barberry, wineberry (*R. phoenicolasius*), multiflora rose, wild privet (*Ligustrum vulgare*), Japanese stilt grass (*Microstegium vimineum*), common reed (*Phragmites australis*), garlic mustard (*Alliaria petiolata*), field garlic (*A. oleraceum*), sericea lespedeza (*Lespedeza cuneata*), and vine- and shrub-form honeysuckles. These rapidly growing species crowd out native vines and shrubs and do not create quality habitat for other native species. Reed canary grass has been noted as a problem in some of the wetlands on LEAD and is becoming a dominant plant in several areas (LEMC, 2020).

Federal laws, policies, and regulations that could affect forest management at LEAD include AR 200-1; Public Law 86-797, the Sikes Act, as amended (16 U.S.C. 670); 10 U.S.C. 2665 (Sale of certain interest in land: logs); DoD Instruction 7310.5 *Accounting for Production and Sale of Lumber and Timber Products*; EO 11990 *Protection of Wetlands*, ESA ; and the National Forest Management Act of 1976 (16 U.S.C. 1601 et seq.). LEAD has a forest management plan in place, which was last updated in 2012. This plan adheres to the regulations listed above. The objective of forest management at LEAD is to manage the depot's forestland for multiple uses: to provide a sustainable yield of wood products, maintain wildlife habitat, improve aesthetics, protect streams and springs, provide forested areas for military training, and to enhance recreational value (e.g.,bird watching, hunting, horseback riding, and hiking). Practices such as forest inventorying, forest product sales, timber stand improvement, forest access road management, encouragement

and protection of natural (or artificial) regeneration, support for cultural and other natural resource surveys, and protection from wildfire, insects, and disease sustain the forested environment.

The Proposed MMF site is primarily open, active agricultural fields with a small row of trees that runs through the center of the site. Additionally, the site is bordered to the north and south by smalls strips of forest. A forest stand delineation was conducted by USACE, Baltimore District in November 2024 that determined the forest to the north of the site is a mid-successional oak/hickory forest. Trees documented in the canopy of the forest include black walnut (*Juglans nigra*), invasive tree-of-heaven (*Ailanthus altissima*), black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*), red maple, (*Acer rubrum*), silver maple (*Acer saccharinum*), European horse chestnut (*Aesculus hippocastanum*), and red elm (*Ulmus rubra*) with 93% canopy closure. The forest edge has a high number of invasive species, at 52%.

The Voelz Gate ACP site is located nearly entirely within the footprint of the current Voelz Gate ACP and active farm field. To the south of the site, there is a swath of forested area that envelops Muddy Run and its surrounding wetlands. To the north of the site, there is a small patch of forested area that surrounds a small intermittent stream (WUS 1).

#### *3.6.1.2 Wildlife*

**Mammals**

Wildlife inventories and field observations conducted between 1987 and 2005, identified thirty-five (35) species of mammals at LEAD. Additionally, a small mammal survey was conducted in 2003 by the LEAD Natural Resources Office in conjunction with Shippensburg University to determine the abundance and distribution of species. Some of the common species of mammals identified include the Virginia opossum (*Didelphis virginiana*), Eastern cottontail (*Sylvilagus floridanus*), Eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), beaver (*Castor canadensis*), red fox (*Vulpes vulpes*) and the white-tailed deer (*Odocoileus virginianus*). A mist netting survey was also conducted in 2000 for the endangered Indiana bat (*Myotis sodalis*). During the survey, several common species of bat were identified, including the big brown bat (*Eptesicus fuscus*) and red bat (*Lasiurus borealis*). The federally endangered northern long-eared bat (NLEB) (*Myotis septentrionalis*) was last identified at LEAD in 2015 when the bat was considered federally threatened (LEMC, 2020).

**Birds**

Wildlife inventories, field observations, and subsequent surveys conducted by the LEAD Natural Resource Office, the Pennsylvania Game Commission, and the Audubon Society identified more than 100 avian species at LEAD. The diverse avian habitats attract migratory species like warblers (*Passeri* spp.) and vireos (*Vireonidae* spp.) that use LEAD as a stopover. Nesting species such as the great blue heron (*Ardea horodias*), Canada geese (*Branta canadensis*), and killdeer (*Charadrius vociferous*) have been observed in spring and summer months. Year-round residents include the ring-necked pheasant (*Phasianus colchicus*), eastern wild turkey (*Meleagris gallopavo*), and woodpeckers (*Picoides* spp.). Grass-land dependent species include the grasshopper sparrow (*Ammodramus savannarum*), field sparrow (*Spizella pusilla*), bobolink (*Dolichonyx oryzivorus*), common yellowthroat (*Geothlypis trichas*), and song sparrow

(*Melospiza melodia*). Other species on LEAD include the European starlings (*Sturnus vulgaris*) and brown-headed cowbirds (*Molothrus ater*) (LEMC, 2020).

Impacts to wildlife from federal artificial light at night must be assessed, with significant impacts mitigated to the extent practicable. UFC 3-530-01 requires full shielding for outdoor lighting, and provides standards for brightness, controls, and spectrum; in sensitive areas for mission and habitat, adherence to USFWS and state lighting design recommendations is mandated. Reference DoD Partners in Flight *Artificial Light At Night Fact Sheet* from Oct 3, 2022, for further details. The Proposed Action would adhere to these regulations.

**Herpetofauna and Fish**

Nineteen (19) species of reptiles have been identified at LEAD as part of the RTE inventories, subsequent surveys, or as field observations. The LEAD Natural Resources Office and Shippensburg University conducted reptile surveys from 2003 to 2005 to determine the abundance and distribution of reptile species. Observed species include the wood turtle (*Clemmys insculpta*), common snapping turtle (*Chelydra serpentina*), eastern box turtle (*Terrapene carolina*), midland painted turtle (*Chrysemys picta marginata*), five-lined skink lizard (*Eumeces fasciatus*), northern water snake (*Nerodia sipedon*), northern copperhead (*Agkistrodon contortrix*), and black rat snake (*Elaphe 3-36odalist*). The LEAD Natural Resources Office and Shippensburg University conducted amphibian surveys from 2003 to 2005 to determine the abundance and distribution of amphibian species. Twenty-four (24) species were observed during these surveys. Another species-specific survey was conducted for box turtles (*Terrapene* spp.), marbled salamanders (*Ambystoma. Opacum*), frogs, and spotted newts (*Notophthalmus* spp.). LEAD includes a vernal pond community within an area of forest bordering Buchanan State Forest in the northwestern portion of LEAD. The vernal ponds on LEAD and in nearby areas house many species including marbled salamanders, spotted salamanders, Jefferson's salamanders (*A. jeffersonianum*), wood frogs (*Rana sylvatica*), spring peepers (*Pseudacris crucifer*), green frogs (*R. clamitans*), pickerel frogs (*R. palustris*), toads (*Bufo* spp.), and red-spotted newts (*N. viridescens*). There is a lack of survey data related to the condition of fisheries on LEAD (LEMC, 2020).

**Pests**

The gypsy moth (*Lymantria dispar dispar*), eastern ash borers (*Agrilus planipennis*), spotted lanternfly (*Lycorma delicatula*), and hemlock woolly adelgid (*Adelges tsugae*) have caused catastrophic deforestation in other parts of the country and are closely monitored in the LEAD area. Occasional gypsy moth infestations have occurred in the western buffer zone of LEAD. Advanced stages of hemlock woolly adelgid infestation were observed in the buffer zone at the foot of and on the eastern slopes of Broad Mountain. Spotted lantern flies have been observed at LEAD.

### *3.6.1.3 Rare, Threatened and Endangered Species*

The ESA requires federal agencies, in consultation with the USFWS to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Critical habitat can include areas not occupied by the species at the time of the listing but are essential to the conservation of the species. The Sikes Act provides for cooperation by the

Department of the Interior and DoD with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the U.S. Section 7 of the ESA requires federal agencies to request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action for any project that is conducted, permitted, funded, or licensed by any federal agency. The Information for IpaC resource list can be found in **Appendix B.** As reported through the USFWS Resource List, there are no critical habitats or wetlands of any type within the project site.

## Federally Listed Species

Based on the IPaC results, from USFWS, five (5) species populated on the official species list: northeastern bulrush (*Scirpus ancistrochaetus,* endangered*),* Indiana bat (endangered), NLEB (endangered), tricolored bat (*Perimyotis subflavus,* proposed) and monarch butterfly (*Danaus plexippus,* proposed threatened*).*

White-nose syndrome, a fungal disease known to affect bats, is the most severe and immediate threat to NLEB, Indiana , and tricolored bat survival and is the basis for the listing of the species' status. During the active season (April 1 to October 31), bats roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and snags.

Monarch butterfly does not require further consultation, however, USFWS may recommend conservation measures that would support the species. Three surveys were conducted for federally listed species that may be on LEAD. The most recent survey, in 2000, included three targeted species: bog turtle (*Glyptemys muhlenbergii*), Indiana bat, and northeastern bulrush. The 2000 survey of all LEAD wetlands found no potential bog turtle habitat on LEAD. No Indiana bats were observed on LEAD either. However, due to the limited nature of the bat survey, it cannot be concluded that there are no Indiana bats present. The 2015 survey identified the federally endangered NLEB bat as occurring on the Installation. Viable northeastern bulrush habitat was found on LEAD, but no species evidence was observed. It is unlikely that the species is present (LEMC, 2020).

The PNDI was also run for the entirety of LEAD's boundary can be viewed in **Appendix B**. The closest natural area to the Proposed Action sites is Keasey Run Wetlands. These wetlands run along the very northern edge of LEAD's boundary and to the southeastern edge. The Voelz Gate ACP site appears to be within the bounds of the Keasey Run Wetlands. This area is a concern for bullrush; however, the proposed site would not affect wetlands. The MMF site does not appear to be in any special nature areas.

## State-Listed Species

Although an Installation-wide flora survey has not been conducted, several surveys were conducted with the following state-listed species identified as occurring or potentially occurring at LEAD. Allegheny woodrat (*Neotoma floridana magister*), lance-leaved loosestrife (*Lysimachia hybrida),* timber rattlesnake (*Crotalus horridus*), eastern spadefoot toad (*Scaphiopus holbrookii*), and brown sedge (*Carex buxbaumii*). Three (3) Allegheny woodrats were trapped during a small mammal survey conducted by the LEAD Natural Resources Office with Shippensburg University in 2003 and 2004. Lance-leaved loosestrife was identified on LEAD during the 2000 endangered

species survey. No brown sedge has been observed on LEAD. Until an Installation-wide flora survey been completed, impacts to listed plants cannot be determined (LEMC, 2020).

### *3.6.2 Environmental Consequences*

#### *3.6.2.1 Significance Criteria*

An alternative would be considered to have a significant impact on biological resources if the Proposed Action caused:

- A permanent net loss of habitat or long-term loss or impairment of a substantial portion of local habitat on which native species depends
- Unpermitted loss or destruction of more than one acre of jurisdictional wetlands, including the filling or alteration of a wetland or portion, thereof that would cause irreversible negative impacts to species or habitats of high concern
- Federally threatened or endangered species incurred any form of 'take' under the ESA

#### *3.6.2.2 Impacts from the Construction of the Proposed Action*

**Vegetation**

At the proposed MMF site, short-term, minor, direct, adverse impacts to vegetation would be expected during construction due to removal or trampling. Long-term negligible adverse impacts would be anticipated with new construction, grading, and permanent vegetation removal. Adverse impacts would occur to any plants growing on the active farm field. At the start of construction, the field would have been harvested and therefore, very little vegetation would remain. Vegetation remaining would be weeds that had seeded in-between the time of harvest and the start of construction. Tree removal would occur on the northern edge of the site as well as at the center tree line. The center tree line would be less than 1 acre to be removed.

At the Voelz Gate ACP location, short-term, minor, direct, adverse impacts to vegetation would be expected during construction and demolition due to any removal or trampling. Long-term, direct, minor adverse impacts would be anticipated with any permanent vegetation removal. The proposed Voelz Gate ACP is surrounded by forested area to the south. The exact quantity of tree removal is unknown and will be minimized to the highest extent possible. A small portion of trees could be removed on the southeastern edge of the project boundary and between Patrol Road on the northern end.

Clearing for both project areas would affect trees and understory that are edge habitat, are currently fragmented or separated from other larger forested areas, or both. The tree clearing would not increase the amount of forest edge habitat but would instead relocate the edge habitat.

Forest edge areas provide opportunities for non-native species to colonize and spread and invasive ground cover species. Due to the exposure of new edge areas along forested tracts, invasive species control will be implemented as dictated through LEAD's INRMP. Only native species that are suitable for this habitat type will be seeded or planted after construction is finished.

**Wildlife**

Short-term, minor, direct, adverse impacts to fish and wildlife resources would be anticipated at both proposed sites due to noise from heavy equipment and construction activities.

At the proposed MMF and Voelz Gate ACP sites, long-term, direct, moderate adverse impacts to fish and wildlife would occur with the construction of impervious surfaces, habitat loss in this undeveloped location, and conversion of land to a location of high use and industrialization. However, these areas are active farmland field and therefore not ideal habitat for woodland creatures, specifically when the field is being harvested. Birds that require field/meadow habitat for food would be negatively impacted by the loss of foraging area.

At all Proposed Action locations, minor, short-term, indirect, adverse impacts to federally listed species may occur due to noise disturbances. Conservation measures provided by the USFWS will be implemented to protected listed species in the project area, if any do occur.

**Rare, Threatened and Endangered Species**

Coordination with USFWS and PNDI using the IPaC website, indicated that there is a possible occurrence of the NLEBs, Indiana Bat, and tricolored bat at the Proposed Site. However, no critical habitat was identified within the anticipated LOD (USFWS, 2024). Part of the IPaC process requires completion of a set of determination keys, involving structured questions to assist in determining whether a proposed project qualifies for a predetermined consultation outcome. The determination key for the Indiana bat determined that the Proposed Action would have no effect, and no additional consultation is required; however, the determination key for NLEB and Tri-Colored Bats indicated the Proposed Action may affect these species, and informal consultation in accordance with the *Interim Consultation Framework for Northern Long-Eared Bat*, (Appendix A) was initiated 4 February 2025. Potential adverse impacts to the NLEB would be minimized by restricting tree clearing to the non-active, overwintering season (October 1 – March 31). Based on the noted time of year restrictions for tree clearing, the USFWS responded in April 2025 that no further Section 7 consultation is required for this project unless project plans change, or when updated Section 7 guidance for northern long-eared bat and new guidance for tricolored bat are expected. USFWS recommended LEAD review the updated guidelines once released and consider reinitiating consultation at that time. This time-of-year restriction will also minimize impacts to herp species (eastern box turtle, wood turtle, spotted turtle (*Clemmys guttata*), and various amphibians/snakes) that may be utilizing the wetland area at the MMF or Voelz Gate ACP Site or are just passing through the project area. All three turtle species utilize Muddy Run and the surrounding wetland habitats.

### *3.6.2.3 Impacts from the Operation of the Proposed Action*

**Vegetation**

Adverse impacts from the operation of the proposed MMF and Voelz Gate ACP would be long term, direct, and minor. Once both were built, vegetation would be adversely impacted by not being allowed to regrow, causing loss of habitat. However, the majority of adverse impacts would occur with the construction of the Proposed Action.

**Wildlife**

Long-term, direct, negligible, adverse impacts would occur with the operation of the MMF and Voelz Gate ACP. Operations of the MMF would create standard noises that could disturb wildlife. However, LEAD already is subject to noise associated with operational buildings and wildlife in the areas is likely desensitized to this type of noise. Noises surrounding the proposed Voelz Gate ACP would be similar to those that are already present in the area with the current ACP therefore, this would be a negligible effect on wildlife.

**Rare, Threatened, and Endangered Species**

The operation of the Proposed Action would have negligible, direct, long-term adverse effects on RTE species. The proposed MMF would add typical operational noise to the area in which it would be built, such as heating, ventilation, and air conditioning noises, car engines, etc. However, LEAD as a whole is a military installation with typical operational noises. The upgrade of the Voelz Gate ACP would not disturb any RTE species any more than other operational noises in the area that they would be accustomed to prior to construction.

#### *3.6.2.4 Impacts from the No-Action Alternative*

No impacts would occur to biological resources under the No-Action Alternative as the Proposed Action area would not change biologically. No demolitions or construction would take place; therefore, all wildlife and vegetation could remain where in place.

## 3.7 CULTURAL RESOURCES

Several federal laws and regulations have been established to manage cultural resources. Cultural resources are "historic properties" as defined by the NHPA of 1966; "cultural items" as defined by the Native American Graves Protection and Repatriation Act of 1979 (NAGPRA); "archaeological resources" as defined by the Archaeological Resources Protection Act of 1979 (ARPA), "sacred sites" as defined by EO 13007, *Indian Sacred Sites*, to which access is afforded under the American Indian Religious Freedom Act of 1987 (AIRFA); and "collections and associated records" as defined in 36 CFR Part 79, *Curation of Federally Owned and Administered Archaeological Collections*.

Cultural resources can include precontact and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on their condition and use, these resources can provide insight into the living conditions of previous existing civilizations, or retain cultural and religious significance to modern groups, referred to as "Traditional Cultural Properties." Traditional Cultural Properties include locations of historic occupations and events, historic and contemporary sacred and ceremonial areas, prominent topographical areas that have cultural significance, traditional hunting and gathering areas, and other resources that Native Americans or other groups consider essential for the persistence of their traditional culture.

Archaeological resources are locations where precontact or historic activity measurably altered the earth or produced deposits of physical remains. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic significance.

In order for a cultural resource to be considered significant, it must meet one or more of the following criteria for inclusion in the National Register of Historic Places (NRHP): the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and: (1) that are associated with events that have made a significant contribution to the broad patterns of our history; or (2) that are associated with the lives or persons significant in our past; or (3) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (4) that have yielded, or may be likely to yield, information important in prehistory or history.

The NHPA, as amended, as well as Federal legislation, and DoD regulations (particularly Army Regulation 200-1, *Environmental Protection and Enhancement*), requires the Army and other Federal agencies to locate, identify, evaluate, and treat cultural resources under their ownership, administration, and control in a manner that fosters the preservation of the resources. Accordingly, the most recent update to the Integrated Cultural Resources Management Plan (ICRMP) for LEAD was finalized in 2020 and will remain valid until the end of 2024.

### *3.7.1 Affected Environment*

#### *3.7.1.1 Area of Potential Effect*

The Area of Potential Effect (APE) for this Proposed Action is the LOD for the proposed MMF facility. For the Voelz Gate ACP, the APE is considered the LOD and anything within a 0.25-mile radius of the LOD.

#### *3.7.1.2 Historic Properties at LEAD*

In 1998, a Programmatic Agreement (PA) for the Base Realignment and Closure (BRAC)-95 actions was finalized and agreed upon by the Army Materiel Command (AMC), Pennsylvania SHPO, and the Advisory Council on Historic Preservation. The PA stated that the entire LEAD installation was considered eligible as a district for the NRHP under Criterion A for its association with the events of World War II. The PA also identified all World War II resources as contributing elements in the historic district with no consideration given to resource integrity, the type of construction (temporary, semi-permanent, or permanent), or whether or not buildings were contributing or non-contributing resources in the district. For purposes of the PA, all buildings constructed at LEAD were considered contributing buildings in the Letterkenny Historic District. Since the PA, the buildings and structures in the Letterkenny Historic District have been evaluated only when undertakings at LEAD evoked the Section 106 process. Historic resource surveys performed at LEAD following this determination satisfied Section 106 requirements. None of these surveys identified any individually eligible or contributing elements to the Letterkenny Historic District.

A total of 20 archeological sites have been recorded at LEAD. The sources used to identify previously recorded sites at LEAD were (1) previous survey reports, (2) the 1999 ICRMP, and (3) the 2007 ICRMP. Eleven of the 20 archeological sites were identified during a 1998 cultural resources survey. Of these 11 sites, six historic sites were recommended as potentially eligible.

However, all 11 sites are located on property that was transferred to private ownership during BRAC-95. The resulting PA stipulates that the transferred archeological sites will be protected with preservation covenants. No archeological sites at LEAD have been formally nominated to or included in the NRHP.

#### *3.7.1.3 Archeological Surveys at the MMF and Voelz Gate ACP Sites*

LEAD has no record of either the MMF or the Voelz Gate ACP areas being surveyed for archaeological sites. In addition to reviewing LEAD's files and previous survey reports, the PA SHPO's online database, PA SHARE, was carefully reviewed to understand the archaeological context of the area.

It was determined that a Phase I Archeological survey was needed to determine the presence or absence of archeological sites at the MMF and Voelz Gate ACP proposed area. USACE conducted a Phase I archeological survey across the MMF and Voelz Gate ACP farmed area LOD in April 2025. No archeological artifacts were found at the sites and concurrence for a "no adverse effect" determination from the PA SHPO is expected for both sites. The Phase I Archeological Report can be found in **Appendix D**. Some maps have been removed from the report for security purposes.

### *3.7.2 Environmental Consequences*

#### *3.7.2.1 Significance Criteria*

Significant impacts on cultural resources would occur if:

- Potential resources that have not been previously documented are not properly identified
- Consultation pursuant to Section 106 is not completed
- Known historic properties are adversely affected
- Impacts on viewsheds within the APE buffer are not appropriately considered and addressed

#### *3.7.2.2 Impacts from Construction and Operation of Proposed Action*

LEAD initiated NHPA Section 106 consultation via a letter to the PA SHPO in 2025 The PA SHPO concurred with LEAD's proposed Phase I workplan. A Phase I archeological survey was concducted at both the MMF & Voelz Gate ACP site in April 2025. The survey concluded that both sites should be recommended to not be eligible for the NRHP. Consultation with the PASHPO provided concurrence with the Phase I findings. It is anticipated there would be no impacts to cultural resources as a result of the construction and operation of the Proposed Action. The water main line would be put directly underneath the existing roadway and would therefore have no effects on cultural resources as the area is already disturbed.

However, there is the potential for adverse impacts to cultural resources in the event of an inadvertent discovery during construction work. To minimize the potential impact to previously unknown cultural resources during subsurface work, LEAD would implement an "Accidental Discovery" plan to comply with the NHPA; NAGPRA; ARPA; EO 13007 to which access is afforded under AIRFA; and 36 CFR Part 79. If precontact or historic artifacts that could be associated with Native American, early European, or American settlement are encountered during construction/operation of the expansion areas, LEAD would cease all activities in the vicinity of

the discovery. Should human remains or other cultural items be discovered during construction work would immediately cease until the LEAD Cultural Resources Manager, PA SHPO, and selected Native American Tribes are contacted to properly identify and appropriately treat discovered items in accordance with applicable state and federal law(s). Implementation of these measures would ensure that the Proposed Action would have no adverse effect on historic properties or cultural resources.

#### *3.7.2.3 Impacts from the No Action Alternative*

Implementation of the No Action Alternative would result in no impacts to cultural resources. The MMF and Voelz Gate ACP would not be constructed. Therefore, there would be no ground disturbances that could impact archaeological, architectural, or Native American resources.

## 3.8 HAZARDOUS AND TOXIC WASTE

The promulgation of Toxic Substance Control Act (TSCA) (40 CFR Parts 700 to 766) represented an effort by the federal government to address those chemical substances and mixtures for which it was recognized that the manufacture, processing, distribution, use, or disposal may present unreasonable risk of personal injury or health of the environment, and to effectively regulate these substances and mixtures in interstate commerce. The TSCA Chemical Substances Inventory lists information on more than 62,000 chemicals and substances. Toxic chemical substances regulated by USEPA under TSCA include asbestos and lead.

The Resource Conservation and Recovery Act (RCRA) defines hazardous waste as wastes or combination of wastes that, because of quantity, concentration, physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. All hazardous wastes are classified as solid wastes. A solid waste is any material that is disposed, incinerated, treated, or recycled except those exempted under 40 CFR 261.4.

### *3.8.1 Affected Environment*

Storage and assembly facilities are scattered across the eastern, northeastern, and southwestern areas of LEMC, but the majority of the built structures reside in the LEAD. Several hazardous-waste site investigations and remediation projects at LEAD have involved groundwater contamination, particularly in and around the cantonment area. These investigations have indicated the presence of volatile organic compound (VOC) contamination. The principal issue of concern is recharge of contaminated groundwater to surface water bodies of LEAD since groundwater is not directly used as a water resource (LEMC, 2020).

LEAD is a RCRA-permitted treatment, storage, and disposal facility. LEAD is also considered a large quantity generator due to the volume of hazardous waste generated. LEAD was established in 1941 prior to the implementation of the TSCA, in which the regulation of asbestos-containing materials began. As such, it is likely that asbestos-containing material is present in the earthen munitions storage igloos and other structures on the LEMC. Similarly, lead may occur on LEMC as Lead-based paint (LBP) in buildings constructed before 1978. LBP chips that fall from the

exterior of buildings can cause soil contamination. Remaining LBP is likely found within the earthen-munitions storage igloos and other structures at LEAD. Neither the MMF nor the Voelz Gate ACP site contain any known hazardous materials.

Neither of the Proposed Action areas are with 1,000 ft of a hazardous waste storage area.

### *3.8.2 Environmental Consequences*

#### *3.8.2.1 Significance Criteria*

Significant environmental impacts of an alternative to hazardous and toxic waste materials would occur if:

- A significant hazard to the public is created or the environment through the routine transport, use, or disposal of hazardous materials or wastes or from reasonably foreseeable accident events
- Impairs implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan
- Requires remediation of unexploded ordnance contamination
- Causes non-compliance with applicable federal and state regulations; or
- Increases site contamination that could preclude future use of the proposed site

#### *3.8.2.2 Impacts from the Construction and Operation of the Proposed Action*

At the proposed MMF and Voelz Gate ACP locations, the Proposed Action would have short-term, direct, minor, adverse impacts associated with the usage of materials, such as paints, solvents, sealants, or fuel during construction of infrastructure.

At the Voelz Gate Site, to earn points towards the LEED Silver requirement, at least 75% of construction and demolition waste will be diverted in accordance with the LEED Construction and Demolition Waste Management credit.

The construction contractor would be required to prepare and adhere to a Spill Prevention, Control, and Countermeasures plan that identifies practices to minimize the potential for accidental spills of petroleum products or other hazardous substances and the procedures for containing and cleaning up any accidental spills that may occur.

Soils excavated or otherwise disturbed during the project's construction phase would be tested in accordance with established LEAD policies and procedures. If concentrations of contaminants in soils are determined to exceed applicable regulatory thresholds for re-use on the site, any affected soils would be removed from the site and disposed of at a permitted facility off LEAD in accordance with Pennsylvania solid waste disposal regulations, as well as all other federal, state, and local laws and regulations. Any hazardous material wastes are required to be shipped to a facility that is properly permitted to accept the hazardous waste and records of the disposal will need to be sent to LEAD. A specific disposal site has not been chosen, but LEAD has a list of landfills that accept hazardous wastes including Blue Ridge Landfill and Cumberland County Landfill. Approximately 326,250 cubic feet of general waste is expected to be produced.

The operation of the MMF and Voelz Gate ACP would have no impacts on hazardous waste and toxic materials.

#### *3.8.2.3 Impacts from the No-Action Alternative*

No impacts to hazardous and toxic waste material resources are expected under the No Action Alternative. There would be no potential of disturbing hazardous waste in or near the proposed sites.

## 3.9 UTILITIES

### *3.9.1 Affected Environment*

This section assesses the water supply, wastewater systems, energy sources, communications, and solid waste service at LEAD. The water, sewer, and electric utilities have been privatized and services have been purchased from the Franklin County General Authority/Letterkenny Industrial Development Authority.

#### *3.9.1.1 Potable Water Supply*

LEAD receives potable water from the Letterkenny Reservoir. This reservoir is located north of the Installation (LEMC, 2020). There is an existing 10-inch water line east of the site in addition to a large water tank 4,000 ft from the site MMF site. The Voelz Gate ACP has an 8-inch watermain pipe 4,000 ft from the site that would be used.

#### *3.9.1.2 Wastewater System*

LEAD uses a privatized wastewater system, which is operated and maintained by Suez Water Pennsylvania Incorporated. Wastewater is collected throughout LEAD in holding tanks and is pumped out. An existing wastewater treatment plant operates to the south of the complex but is not currently used for existing facilities in LEAD.

#### *3.9.1.3 Energy Sources*

The electrical power at LEAD is provided by Allegheny Power's Letterkenny substation, which also provides power for LEMC. The substation is served from a single feeder that approaches from the east, where it ties to the Allegheny Power distribution grid. Power is then distributed from the adjacent switch station. LEMC is sub-fed on an aerial distribution system. (LEMC, 2020) The local utility comply has confirmed there is sufficient capacity to accommodate the power demand of the Proposed Action. Several facilities on LEAD operate on generators and are not connected to the system. The MMF site would have access to electrical via existing electrical connections to the west of the site. The Voelz Gate ACP site has existing electrical connections that would be upgraded to meet site lighting requirements.

#### *3.9.1.4 Natural Gas*

LEAD is currently in the process of converting the facility from propane to natural gas. Gas service only exists in certain areas of LEAD and LEMC. A privatized company, UGI Utilities, Incorporated Gas Division supplies the natural gas on LEMC. There are no existing gas lines servicing any of the sites under the Proposed Action (LEMC, 2020).

#### *3.9.1.5 Communications*

Aerial mounted copper (voice) and fiber optic (data) cabling exists along the existing utility pole lines and direct bury lines throughout LEMC.

#### *3.9.1.6 Solid Waste*

Solid waste is collected and disposed through Waste Management, Incorporated who transports the waste to Upton, Pennsylvania and places it in a landfill owned by Waste Management of Central Pennsylvania (LEMC, 2020).

### *3.9.2 Environmental Consequences*

#### *3.9.2.1 Significance Criteria*

Significant environmental impacts of an alternative to utilities would occur if:

- Existing utilities and their connector points were altered or removed
- New utilities were constructed that surpassed the capabilities of existing infrastructure
- An impairment occurred to the local community, including residential homes or businesses
- Existing utilities were relocated

#### *3.9.2.2 Impacts from the Operation of the Proposed Action*

At the proposed MMF location, long-term, minor, direct, adverse impacts would be anticipated under the Proposed Action from the construction of new utilities (stormwater, electric, water supply, etc.) on undeveloped land. This would put a higher load on existing infrastructure at LEAD. All communication needs for the proposed MMF have been vetted by the appropriate companies to ensure utility demands would not exceed capabilities. Electrical usage at LEAD is approximately one megawatt while the allowable supply is nine megawatts.

At the Voelz Gate ACP site, short-term, direct, negligible adverse impacts would be anticipated due to the temporary shutdown of utilities to provide safe working conditions for construction workers. This would have no impact on families, civilians, or employees in adjacent locations from the project site. The Voelz Gate ACP site proposed utilities have also been vetted by the appropriate companies and will not exceed the current LEAD capabilities. The new Voelz Gate ACP site would use a similar amount of power, electricity, etc. as the existing ACP and therefore would have negligible effects.

#### *3.9.2.3 Impacts from the Operation of the Proposed Action*

The Voelz Gate ACP site would be provided with approximately 75KVA for the building electrical service transformer and will be equipped with a full capacity diesel generator for back-up power. In addition, the site would contain an on-site septic holding tank.

The MMF site would contain an on lot septic disposal system that treats sanitary sewage.

The operation of the MMF and Voelz Gate ACP would increase utility usage and create minor, long-term, direct impacts to utilities; however, the usage is well within the capabilities of the systems in place at LEAD.

#### *3.9.2.4 Impacts from the No-Action Alternative*

No impacts to utility resources are expected under the No Action Alternative as no increased utility demands would occur.

## 3.10 TRANSPORTATION AND TRAFFIC

### *3.10.1 Affected Environment*

The area around LEAD is served by U.S. Highway 11, U.S. Highway 30, Interstate 81, and the Pennsylvania Turnpike is 14 miles north of the facility via Pennsylvania State Route 997. Direct access to LEAD is provided by Pennsylvania State Route 433 and 997. The primary entrance to LEAD is via the access point on Coffey Avenue. LEAD includes 123 miles of paved roadways and additional unpaved roadways. The unpaved roadway network includes direct connections between storage areas. Many of the existing roadways and gate systems within LEAD have not been adequately maintained and need repair (LEMC, 2020).

The proposed MMF site is accessible from the western portion of LEMC via Georgia Avenue after passing through the security checkpoint at Georgia Avenue from LEAD to LEMC. The proposed site is approximately 6.5 miles west from the Georgia Avenue security checkpoint, between Dud Road and Rocket Road.

The Voelz Gate ACP site is located on the northeastern portion of LEMC off Cumberland Highway/ Route 977 via the current Voelz Gate ACP.

### *3.10.2 Environmental Consequences*

#### *3.10.2.1 Significance Criteria*

Significant environmental impacts to transportation or traffic would occur if the Proposed Action:

- Contributes to a long-term increase in vehicle traffic that could not be accommodated by the existing roadway network
- Results in long-term traffic circulation problems and in the surrounding community
- Increases annual average daily traffic volume by 20 % or more

### *3.10.2.2 Impacts from the Construction of the Proposed Action*

At the proposed MMF and Voelz Gate ACP sites, short-and long-term minor, direct, adverse impacts would be anticipated during construction. Construction vehicles would require daily site access and would temporarily increase traffic.

### *3.10.2.3 Impacts from the Operation of the Proposed Action*

MMF

Operation of the proposed MMF would likely cause minor, long-term adverse impacts to transportation and traffic in and around LEMC due to an increase in commercial shipping and receiving (tractor trailers), which are essential to the PrSM mission. One way to mitigate the anticipated increase in vehicle traffic and volume, is the expansion and reconfiguration of the Voelz Gate ACP.

Voelz Gate ACP

Operation of the Voelz Gate ACP would likely have a long-term, moderate beneficial impact to transportation and traffic in and around LEAD. As described above, the proposed ACP design will include additional inspection areas, expanded queuing space for tractor trailers entering the installation, and new parking areas for overnight storage. Additionally, the proposed ACP will meet required UFC 4-022-01, *Entrance Control Facilities/Access Control Points* for a commercial vehicle ACP.

A traffic study was conducted to assess traffic patterns and volume at the current Voelz Gate ACP. Peak traffic times were assessed to be between 6:45AM-7:45AM and 3:30PM-4:30PM. The study determined the ACP has a minimum level of service of B for the AM peak hour and a minimum level of service of C for the PM peak hour. However, the intersection operates at an overall level of service A during both peak hours. The proposed ACP will provide sufficient space for the anticipated increase in commercial vehicle queuing and parking. Levels of service were determined using **Table 3-4**. The traffic study can be seen in **Appendix E.** Road names have been removed from the report for security purposes. Calculations in the traffic study indicate in 2028 (when the new Voelz Gate would be operational), it would still operate at a B level for AM peak hours, a C level during PM Peak hours; and an A level overall during both peak hours. These are the same level of service as the current ACP.

***Table 3-4: Voelz Gate Traffic Rating***

| Level of Service | Average Control Delay (seconds/vehicle) Unsignalized |
|---|---|
| **A** | Less than 10.0 |
| **B** | ≥ 10.0 and < 15.0 |
| **C** | ≥ 15.0 and < 25.0 |
| **D** | ≥ 25.0 and < 35.0 |
| **E** | ≥ 35.0 and < 50.0 |
| **F** | Greater than or equal to 50.0 or v/c greater than 1.0 |

**Source:** ***Highway Capacity Manual 6th Edition***

### *3.10.2.4 Impacts from the No-Action Alternative*

No impacts to transportation and traffic resources are expected under the No Action Alternative as no changes in traffic would occur from construction, demolition, or operational changes.

## 3.11 NOISE

Noise is traditionally defined as unwanted sound that interferes with normal activities in a way that reduces the quality of the environment. Magnitudes of sound, whether wanted or unwanted, are usually described by sound pressure. There are two primary types of sound sources that generate noise: stationary and transient. Sounds produced by these sources can be intermittent or continuous. A stationary source is usually associated with a specific land use or site, such as construction activities or the operation of generators. Transient sound sources, such as vehicles and aircraft, move through the area.

The Noise Control Act of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The Act also serves to (1) establish a means for effective coordination of federal research and activities in noise control; (2) authorize the establishment of federal noise emission standards for products distributed in commerce; and (3) provide information to the public with respect to the noise emission and noise reduction characteristics of such products. The Act provided the framework for states and local authorities to establish noise regulations.

Sound pressure levels are quantified in decibels (dB); the dB are then "weighted" to account for differences in how people respond to sound in what is known as the "A-weighted" decibel (dBA) scale (Federal Aviation Administration [FAA], 2022). Sound levels, in dBA, for common activities and construction work are presented in **Table 3-5** below. Noise levels and durations from these activities would vary depending on the specific equipment being used, and the impact from this noise on a receptor would depend on the distance between the receptor and the source of the noise. Generally, noise levels decrease by approximately six dBA for every doubling of distance for point sources (such as a single piece of construction equipment) and approximately three dBA for every doubling of distance for line sources (such as a stream of motor vehicles on a busy road at a distance) (Federal Highway Administration [FHWA], 2006).

***Table 3-5. Common Sound Levels and Exposure Conditions***

| Source | Decibel Level (in dBA) | Exposure Concern |
|---|---|---|
| Silent Study Room | 20 | Normal safe level |
| Library | 35 | |
| Soft Whisper (5 ft. away) | 40 | |
| Average Home in an urban area | 50 | |
| Dishwasher in next room | 55 | |
| Conversational speech (3 ft. away) | 65 | |
| Classroom Chatter | 70 | |
| Freight Train (100-ft. away) | 80 | May affect hearing in some individuals depending on sensitivity, exposure length, etc. |
| Heavy Traffic | 90 | |
| Construction Site | 100 | |
| **Source** | **Decibel Level (in dBA)** | **Exposure Concern** |
| Operating Heavy Equipment | 120 | |
| Live Rock Band | 130 | |

| | | |
|---|---|---|
| Fighter Jet Launch | 150 | Above 140 decibels may cause pain. |
| Shotgun Blast | 160 | |
| Rocket Launch | 180 | |

*Source: Table adapted from the following three references: FAA, 2022; Occupational Safety and Health Administration (OSHA), 2022; and Pulsar Instruments, 2022.*

Another important noise metric is the day-night average sound level (DNL). DNL is used to reflect a person's cumulative exposure to sound over a 24-hour period (FAA, 2022). According to the U.S. Department of Housing and Urban Development criteria, residential units and other noise-sensitive land uses are "unacceptable" in areas where the noise exposure exceeds the DNL of 75 dB, "normally unacceptable" in regions exposed to noise between the DNL of 65 to 75 dB, and "acceptable" in areas exposed to noise where the DNL is 65 dB or less.

LEAD is primarily surrounded by agricultural land; however, there are several nearby noise receptors that need to be considered as a part of the noise analysis. Private are rural residences a short distance from the property boundary. Upper Strasburg and Pleasant Hall are small residential communities that are located north of LEAD. To the south and southeast rural residences are relatively close to the property boundary. Cheesetown, Green Village, and the northern most portion of Chambersburg are all approximately one mile south/ southeast of LEAD (LEMC, 2020).

### *3.11.1 Environmental Consequences*

#### *3.11.1.1 Significance Criteria*

The Proposed Action would be considered to have impacts to noise if:

- Residential and business properties were affected during daytime or nighttime hours excessively
- Continuous construction noises above 60 dBA may be considered significant if audible at residential properties or other sensitive receptors during daytime hours, or results in excessive ground-borne vibration to persons or property.

#### *3.11.1.2 Impacts from the Construction of the Proposed Action*

***Table 3-6: Typical Noise levels of Construction Equipment (Noise Level in dBA at 50 Feet)***

| Construction Vehicle Type | dBA |
|---|---|
| Bulldozers | 80 |
| Backhoe | 72-93 |
| Bobcat | 72-93 |
| Jack Hammer | 81-98 |
| Crane | 75-77 |
| Pick-Up Truck | 83-94 |
| Dump Truck | 83-94 |

*Source: USEPA, 1986*

MMF

At the proposed MMF site, the Proposed Action would have minor, short-term, direct, adverse impacts to noise from construction and heavy equipment use. Noise would be typical of a

construction site and the equipment listed in **Table 3-6**. The site has a tree line noise buffer surrounding it on all sides. In addition, there are no sensitive noise receptors within close proximity to the proposed site. The closest Child Development Center (CDC) would not be affected by the noise.

Voelz Gate ACP

At the proposed Voelz Gate ACP, there would be minor, short-term, direct, adverse impacts to noise from construction and heavy equipment use. There are some forest buffers around the site, specifically to the south, and on privately owned land along Cumberland Highway. The forests can serve as a noise buffer; however, it is likely nearby residential homes, may still hear some construction noise, specifically during fall and winter months. It is important to note, any constriction noise would be temporary, and would only occur between working, daytime hours.

#### *3.11.1.3 Impacts from the Operation of the Proposed Action*

MMF

Overall, the Proposed Action would have long-term, minor, direct, adverse impacts to noise. The MMF would produce typical operational noises similar to those present at LEAD. It would be a large building addition to an area that did not produce year-round operational noises previously. Noise production would occur primarily from trucks and generators.

Voelz Gate ACP

The Voelz Gate ACP would produce noise very similar to what is already being produced at the site currently.

#### *3.11.1.4 Impacts form the No Action Alternative*

No impacts to noise would occur under the No Action Alternative as no construction or demolition would occur. Operational noises typical to farming activities would continue to occur, several times a year at both sites. The current Voelz Gate ACP site would continue to produce noise from incoming and outgoing trucks

## 3.12 AIR QUALITY

### *3.12.1 Affected Environment*

#### *3.12.1.1 National Ambient Air Quality Standards and Attainment Status*

USEPA Region 3 and PADEP Bureau of Air Quality regulate air quality in Pennsylvania. The CAA (42 USC 7401–7671q), as amended, gives the USEPA the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50, *National Primary and Secondary Ambient Air Quality Standards*, amended 1 July 2016, hereafter referred to as 40 CFR 50), acceptable concentration levels for seven criteria pollutants: particulate matter less than 10 microns ($PM_{10}$), particulate matter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide ($SO_2$), carbon monoxide (CO), nitrogen oxides (NOx), ozone ($O_3$), and lead. Short-term standards (i.e., 1-, 8- and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (i.e., annual averages) have been established for pollutants that

contribute to chronic health effects (**Table 3-7**). Each state has the authority to adopt standards stricter than those established under the Federal program. The DEP has adopted the NAAQS and is responsible for maintaining air quality standards for Pennsylvania.

Primary and secondary NAAQS for the aforementioned criteria are presented in areas that exceed the NAAQS ambient concentration (i.e., have poor air quality) and are labeled as nonattainment areas designated by federal regulations. According to the severity of the pollution problem, areas exceeding the established NAAQS are categorized as marginal, moderate, serious, severe, or extreme nonattainment. Maintenance areas have recently met NAAQS but are considered to be at risk of not remaining in attainment if efforts are not continued to maintain better air quality. LEAD is within the Central Pennsylvania Air Quality Control Region (40 CFR Part 81.28). (USEPA, 2022a). This area is in attainment for all criteria pollutants (USEPA, 2023).

***Table 3-7 Federal and State Ambient Air Quality Standards***

| NAAQS Pollutant | Primary/ Secondary | Averaging Time | Level[(1)] | Form |
|---|---|---|---|---|
| CO | Primary | 8-hour | 9 ppm | Not to be exceeded more than once per year |
| | | 1-hour | 35 ppm | |
| Nitrogen Dioxide | Primary | 1-hour | 100 ppb | 98th percentile, averaged over 3 years |
| | Primary and secondary | Annual | 53 ppb | Annual Mean |
| $O_3$ | Primary and secondary | 8-hour | 70 ppb | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |
| $PM_{2.5}$ | Primary | Annual | 12 µg/m$^3$ | Annual mean, averaged over 3 years |
| | Secondary | Annual | 15 µg/m$^3$ | Annual mean, averaged over 3 years |
| | Primary and secondary | 24-hour | 35 µg/m$^3$ | 98th percentile, averaged over 3 years |
| $PM_{10}$ | Primary and secondary | 24-hour | 150 µg/m$^3$ | Not to be exceeded more than once per year on average over 3 years |
| Lead | Primary and secondary | Rolling 3-month average | 0.15 µg/m$^3$ | Not to be exceeded |
| $SO_2$ | Primary | 1-hour | 75 ppb | 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
| | Secondary | 3-hour | 0.5 ppm | Not to be exceeded more than once per year |

**Units of measure for the standards are parts per million by volume (ppm), parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m$^3$)*

### *3.12.1.2 Hazardous Air Pollutants*

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs). The National Emission Standards regulate 188 HAPs based on available control technologies. The majority but not all HAPs are VOCs (USEPA, 2022a). Sources of HAP emission at LEAD include stationary, mobile, and fugitive emissions. Stationary sources

elsewhere at LEAD include boilers, generators, water heaters, incinerators, fuel storage tanks, fuel-dispensing facilities, vehicle and maintenance shops. Mobile sources of emissions include private and government-owned vehicles. Fugitive sources include dust generated from construction activities and roadway traffic.

#### *3.12.1.3 Clean Air Act Conformity*

State agencies (in Pennsylvania, DEP) develop air quality plans, which are also referred to as State Implementation Plans (SIPs), designed to attain and maintain the NAAQS and to prevent significant deterioration of air quality in areas which demonstrate air that exceeds NAAQS standards. Pennsylvania has individual SIPs for various pollutants, including Nitrogen Dioxide, $PM_{2.5}$, 8-hour $O_3$, regional haze, etc. Federal agencies must ensure that their actions conform to the SIP in a nonattainment area, and do not contribute to new violations of ambient air quality standards, or an increase in the frequency or severity of existing violations, or a delay in timely state and/or regional attainment standards. The 1990 amendments to the CAA require Federal agencies to ensure that their actions conform to the SIP in a nonattainment area. The purpose of the General Conformity Rule is to:

- Ensure Federal activities do not interfere with the budgets in the SIPs
- Ensure the attainment and maintenance of NAAQS
- Ensure actions do not cause or contribute to new violations of NAAQS

USEPA has developed two distinctive sets of conformity regulations: one for transportation projects and one for non-transportation projects. Non-transportation projects are governed by general conformity regulations (40 CFR Part 93, *Determining Conformity of Federal Actions to State or Federal Implementation Plans*, dated November 24, 1993, hereinafter referred to as 40 CFR 93). The Proposed Action is a non-transportation project within an attainment area.

Current emission sources at LEAD are associated with staff and visitor vehicles, building heating, ventilation, and air conditioning, generators, water heaters, and routine grounds maintenance activities.

Within the MMF site, the only current emissions are those produced by farming equipment. Within the Voelz Gate ACP area, the current emissions include the incoming and outgoing trucks accessing the gate as well as any large farm equipment used to tend the agricultural fields.

#### *3.12.1.4 Sensitive Receptors*

Children, elderly people, and people with illnesses are especially sensitive to the effects of air pollutants; therefore, hospitals, schools, convalescent facilities, and residential areas are considered to be sensitive receptors for air quality impacts, particularly when located within one mile from the emissions source. LEAD houses a childcare development center that is a safe distance of over a mile from either site.

There are several sensitive receptors, including other hospitals, schools, religious institutions, and elderly and childcare facilities within one mile of LEAD, outside of its boundaries and security fencing.

### *3.12.2 Environmental Consequences*

#### *3.12.2.1 Significance Criteria*

Impacts to air quality would be considered significant if the Proposed Action would:

- Result in a NAAQS attainment area becoming a nonattainment area

**Criteria Pollutants and General Conformity**

To determine whether the GCR applies and what the level of effects would be under NEPA, LEAD estimated all direct and indirect emissions and compared them to the *de minimis* thresholds (**Table 3-6**). Construction emissions were estimated for fugitive dust, on- and off-road diesel equipment and vehicles, architectural coatings, asphalt paving, and worker trips during the construction of the Proposed Action. It was assumed that all construction activities would be accomplished within a 1.5-year period. Regardless of the ultimate implementation schedule (i.e., whether accomplished within three years or not), annual emissions would be less than or equal to those estimated in this EA. Small changes in the siting of the facilities, the final design, and moderate changes in the quantity and types of equipment used would not substantially influence the emissions estimates or change the determination under the GCR or the level of effects under NEPA.

**Table 3-8** presents a summary of the estimated emissions due to implementation of the Proposed Action. Estimated annual emissions are projected to be below the *de minimis* levels for CAA conformity; therefore, a formal conformity determination under Section 176(c) of the CAA would not be required. U.S. Army guidance dictates that a Record of Non-Applicability (RONA) be prepared for federal actions in which proposed emissions are clearly *de minimis* to comply with the GCR. Detailed emission calculations and a RONA are provided in **Appendix C.**

***Table 3-8: Estimated Annual Construction and Operational Emissions***

| Year | Criteria Pollutants | | | | | |
|---|---|---|---|---|---|---|
| | CO | VOC | $NO_X$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ |
| | Emissions (tons/year) | | | | | |
| **2026** | 1.92 | 0.319 | 2.877 | 0.007 | 78.984 | 0.108 |
| **2027** | 5.487 | 0.506 | 4.472 | 0.011 | 83.373 | 0.159 |
| **2028** | 3.543 | 0.405 | 2.388 | 0.009 | 0.088 | 0.079 |
| **2029** | 0.031 | 0.011 | 0.047 | 0.010 | 0.010 | 0.010 |
| **Project Lifetime Total** | **10.981** | **1.241** | **9.784** | **0.037** | **162.455** | **0.356** |
| **General Conformity *De Minimis* Annual Thresholds ( 40 CFR 93.153 (b) (1))** | **100** | **50** | **100** | **100** | **100** | **100** |

Annual emissions resulting from project activities have been conservatively estimated using data presented in **Appendix C**, general air quality assumptions, and published emission factors. Emissions from on-road heavy and light duty diesel-fueled trucks associated with the delivery and distribution of construction materials and general on-site construction support, as well as those from construction workers' passenger vehicles, were included in this analysis. Assumptions of travel distance incorporated in the calculations for the different vehicle categories are found in **Appendix C.**

Based on these estimates provided in **Table 3-8**, the annual emissions emitted during construction would not exceed the Annual USEPA NAAQS *de minimis* thresholds and a General Conformity determination is not required.

In addition, project construction equipment would emit minor amounts of HAPs. The main sources of HAPs would occur from the combustion of diesel fuel. Construction would be temporary and minor HAPs emissions could be further moderated through implementation of BMPs such as restricting excessive idling, adherence to equipment maintenance programs, use of particulate filters, and use of ultra-low sulfur diesel fuel if applicable.

#### *3.12.2.2 Impacts from Construction of the Proposed Action*

The construction of the Proposed Action would result in short-term moderate, direct, adverse impacts to air quality, primarily due to construction equipment and activities. Under the Proposed Action, potential air quality impacts from construction activities would occur from combustion emissions due to the use of fossil fuel-powered equipment and vehicles and particulate emissions during earth-moving activities.

Construction activities may generate fugitive dust including coarse and fine particulate emissions which would temporarily affect local air quality. The number of particulate emissions can be estimated from the amount of ground surface exposed, the type and intensity of activity, soil type and conditions, wind speed, and dust control measures used. To limit these emissions, construction BMPs, generally including water- or chemical-based dust suppression, would be implemented to reduce fugitive dust generation and further prevent it from becoming airborne. No long-term increases in fugitive dust are expected to occur, because the source of emissions is limited and would cease upon completion of the Proposed Action construction.

Architectural coatings (e.g., paint) would generate emissions because these coatings often contain VOCs, which are released to the atmosphere when the paint is applied. The emissions generated from coatings is based on the area to be coated. The formula for emissions calculations is found in **Appendix C**.

#### *3.12.2.3 Impacts from Operation of the Proposed Action*

The operation of the Proposed Action would result in long-term, minor, direct, adverse impacts to air quality. Operational emissions of the MMF would be limited to heating/air conditioning and ventilation. Other operational emissions would be related to emissions from vehicles used to drive to and from the MMF facility.

Operation of the Voelz Gate ACP would have emissions similar to current emissions and would have negligible effects on air quality.

#### *3.12.2.4 Impacts from the No Action Alternative*

Implementation of the No Action Alternative would result in no impacts to air quality. The facility would not be constructed, and there would be no changes in air quality in or around LEAD.

Implementation of the No Action Alternative will not result in any impacts to air quality.

## 3.13 HUMAN HEALTH AND SAFETY

### *3.13.1 Affected Environment*

Under NEPA, federal agencies are required to consider the environmental consequences of their proposed actions. This consideration is broad in scope and includes an analysis of effects the action could have on the human environment, including human health and safety. This section will consider existing conditions at the Proposed Action area relative to human health and safety, including the existing health and safety conditions and protocols pertaining to workers and the general public.

In order to protect worker health and safety, workers would be expected to comply with all federal laws such as Occupational Safety and Health Administration (OSHA) regulations, state and local regulations, and general contractor safety plans during the construction of the MMF and Voelz Gate ACP. Any electrical work for the Proposed Action would conform to applicable electrical and fire code requirements. Any hazardous area or rooms identified will be separated from the remainder of the building. For business occupancies these include general storage, boiler or furnace rooms.

### *3.13.2 Environmental Consequences*

Impacts to human health and safety would be considered significant if the Proposed Action results in direct human exposure to a health hazard or a safety risk substantially increases due to the Proposed Action.

#### *3.13.2.1 Impacts from Construction of the Proposed Action*

Under the Proposed Action, no adverse impacts to human health and safety would be expected to occur. The company awarded the construction project would be required to implement a site-specific health and safety plan in accordance with OSHA regulations. This plan would be reviewed by the LEAD for adequacy prior to the start of work on the site. The approved plan would be strictly followed during the proposed construction project. All efforts would be focused on reducing job hazards on the site for all construction activities. The minimum worker safety personal protective equipment ensemble would require hard hat, safety glasses, work gloves, and steel-toed boots to enter the construction area. Additional safety gear may be required based on work activities.

#### *3.13.2.2 Impacts from Operation of the Proposed Action*

<u>MMF</u>
No adverse impacts would occur under the operation of the Proposed Action. The proposed MMF would be designed to meet all regulations for the handling of munitions including ESQD arcs, DESR 6055.9 (01.2019), fire protection, DA Pamphlet 385-64 *Ammunition and Explosives Safety*, UFC 4-420-01 *Ammunition and Explosive Storage Magazine, with Change 1*, Technical Manual 5–1300*,* and LEAD's Explosive Safety Plan and antiterrorism/force protection (ATFP) design

requirements, including UFC 4-010-01 *DoD Minimum Antiterrorism Standards for Buildings, With Change 3*.

Voelz Gate ACP

The proposed ACP would have no impacts from operation to human health and safety. It would also follow all standard regulations including UFC 4-022-01, *Entrance Control Facilities/Access Control Points* for a commercial vehicle ACP.

#### *3.13.2.3 Impacts from the No Action Alternative*

Under the No Action Alternative, no impacts would occur. The MMF would not be built, with no impacts to health and safety. In addition, the existing Voelz Gate ACP would operate under its current standards, which meet safety standards.

## 3.14 SOCIOECONOMICS

### *3.14.1 Affected Environment*

#### *3.14.1.1 Socioeconomic Environment*

Socioeconomic characteristics are defined by the interaction or combination of social and economic factors. Most of LEAD lies within the Letterkenny Township, with small portions in Hamilton Township to the south. According to the 2013 to 2017 American Community Survey (5-Year Estimates) the estimated population of Letterkenny Township is around 2,406 and the median household income is $53,523. According to the same survey, the median household income in Franklin County is $52,637; and the median household income for Pennsylvania is $53,046. Letterkenny Township is above the national median household income by about $500 per year. LEAD employs 2,480 people, including 1,484 Department of Army (DA) civilians and 996 contractors. LEAD is one of the largest employers in the area and contributes over 300 million dollars to the regional economy (LEMC, 2020). **Table 3-9** shows a summary of selected socioeconomic and demographic statistics and summarizes the range of population densities in the affected county and city in the area.

***Table 3-9:Demographics Near the Proposed Action***

| Race/Ethnicity | Pennsylvania | Chambersburg, PA | Franklin County, PA | Block Group 420550102002 (Census Tract 102) |
|---|---|---|---|---|
| **Total Population Count** | 13,002,700 | 22,141 | 155,592 | 2,435 |
| Hispanic or Latino | 8% | 22% | 6% | 0% |
| White | 74% | 62% | 87% | 96% |
| Black or African-American | 11% | 10% | 3% | 0% |
| American Indian and Alaska Native | <1% | 0% | 0% | 0% |
| Asian | 4% | 1% | 1% | 1% |

| | | | | |
|---|---|---|---|---|
| Native Hawaiian & Other Pacific Islander | <1% | 0% | 0% | 0% |
| Some other race | 4% | 0% | 0% | 0% |
| Two or more races | 6% | 4% | 3% | 3% |
| **Total People of Color Percent** | 22% | 38% | 13% | 4% |

**Hispanic population can be of any race. * May not sum to totals due to rounding.*

***Table 3-10: Income and Poverty Near the Proposed Action***

| Income and Poverty Characteristics | Pennsylvania | Chambersburg, PA | Franklin County, PA | Block Group 420550102002 (Census Tract 102) |
|---|---|---|---|---|
| **Median household income** | 71,79 | $53,493 | $74,002 | 74,596 |
| **Per capita income,** | 41,489 | $26,874 | $33,394 | 29,310 |

*Source: 2022 ACS Per Capita Income in the Past 12 Month (in 2022 Inflation-Adjusted Dollars) Table B19301. 2022 ACS Per Capita Income in Past 12 Months. Table S1901.*

#### *3.14.1.2 Protection of Children*

On 21 April 1997, President Clinton issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO directs each federal agency to ensure that its policies, programs, activities, and standards address disproportionate environmental health or safety risks to children that may result from the agency's actions. EO 13045 recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health and safety risks due to still developing neurological, immunological, physiological, and behavioral systems. Examples of risks to children include increased traffic volumes and industrial- or production-oriented activities that would generate substances or pollutants that children could encounter and ingest. Children are present as residents and visitors (e.g., living in family housing), using recreational facilities on the Installation. The CDC provides childcare services to the children of LEAD. Precautions have been taken in these areas for their safety by limiting access to certain areas, protective fencing, and adult supervision.

### *3.14.2 Environmental Consequences*

#### *3.14.2.1 Significance Criteria*

Significant environmental impacts of an alternative to socioeconomics would occur if:

- The health, safety, social structure, or economic viability of a surrounding population are affected
- Activities occur that would disproportionately raise risks to children through environmental or health hazards

#### *3.14.2.2 Impacts of from the Construction of the Proposed Action*

Overall, no impacts to low-income families, or children are expected as the site does not encompass a local community.

Short-term, minor, direct, beneficial impacts to socioeconomics are expected from the Proposed Action during the construction period, as jobs created from the construction of the Proposed Action would generally stimulate economic activity within the area, such as spending at restaurants within and surrounding LEAD. Additionally, construction activities would not induce changes in employment, housing, or demands on education or community resources within the community because the time frame of the work is of a short duration, such that temporary or permanent relocation of families would not be anticipated as a result of the Proposed Action.

This EA has identified no environmental health and safety risks from construction of the Proposed Action that would disproportionately affect children. Although there is a CDC within a mile of the sites, no children reside in or visit the Proposed Action area. Temporary construction safety fencing would be erected around the construction area, preventing unauthorized access to the site by any age group, including children.

#### *3.14.2.3 Impacts from the Operation of the Proposed Action*

No impacts would occur to socioeconomics from operation of the Proposed Action. The MMF and the Voelz Gate ACP are not expected to require relocation of any workers to the new sites. Additionally, the operation of the MMF or the Voelz Gate ACP would not affect any nearby communities. All operations would occur within LEAD boundaries and would not be noticeable to the surrounding communities.

#### *3.14.2.4 Impacts from the No-Action Alternative*

No impacts to socioeconomic resources are expected under the No Action Alternative as no changes would occur from constriction or demolition.

## 3.15 CUMULATIVE IMPACTS

#### *3.15.1.1 Definition of Cumulative*

The cumulative impacts analysis within an EA should consider the potential environmental impacts resulting from the incremental impacts of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Assessing cumulative impacts involve defining the scope of the other actions and their interrelationship with a Proposed Action. The scope must consider geographic and temporal overlaps among the Proposed Action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative impacts are most likely to arise when a relationship or synergism exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the Proposed Action would be expected

to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative impacts.

To identify cumulative impacts the analysis needs to address three fundamental questions:

- Does a relationship exist such that affected resource areas of the Proposed Action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the geographic extent of the cumulative effects analysis is LEAD property and surrounding roadways. **Table 3-11** identifies projects occurring within the same general time frame at LEAD and the immediate vicinity, and whose effects, when added to those of the Proposed Action, may result in cumulative effects.

***Table 3-11 Actions At/Surrounding LEAD Potentially Causing Cumulative Effects***

| Project | Description |
|---|---|
| **LEAD Fire Station** | Construct a two-company, two-story headquarters fire station capable of providing fire station services to LEAD and the surrounding community. It would include four apparatus bays to house two fire engines, a ladder truck, a tanker truck, a command vehicle, a brush truck, an ambulance, and a HAZMAT vehicle. The structure would include individual fire equipment storage, breathing apparatus maintenance area, residential living areas with bedrooms for 12 fire fighters and two chief suites, administration areas, and training areas. |
| **Guided Missile and Maintenance Facility** | Construct a depot-level maintenance and certification facility at LEAD for the test, repair, and recertification of the Army's Phased Array Tracking Radar to Intercept On Target Advanced Capability-3 Missile Segment Enhancement. This project would be located along Florida Avenue near Bayonet Road. |
| **Access Control Point** | Construct a new Access Control Point off Georgia Road from Highway 997. This proposed site was cleared previously and is a well graded site. There are currently no remediation factors anticipated for this project and nothing was found during the previous disturbance of the site for grading and drainage construction. |
| **Joint Missile Maintenance Facility** | Construct a guided missile maintenance facility for the LEMC missile maintenance operations for Compatibility Group E and J missile variants. Supporting facilities include site development, utilities and off-site utility connections, lighting paving, parking, walks, storm drainage, information systems, landscaping, and signage. |

| Project | Description |
|---|---|
| **Component Rebuild Shop** | Construct a Component Rebuild Shop to support the Avenger Modification Mission. This project includes vehicle and equipment maintenance bays, internal vehicle and equipment wash area, overhead cranes, administrative area, fire protection and alarm systems, Intrusion Detection System installation, and Energy Monitoring Control Systems connection. Sustainability and energy enhancement measures are included. |
| **Microgrid** | Construct a microgrid with a ground source heat pump for Guided Missile Maintenance Compound, (including buildings 5800 and 5803). Microgrid includes a photovoltaic array, backup generators, battery energy storage, switching and controls, fuel supply and storage. Ground source heat pump consists of ground loop, heat pumps, plumbing systems, and mechanical room addition with existing HVAC retrofit. |
| **Missile/Munitions Distribution Facility and Rail Classification Yard** | Construct a Missile/Munitions Distribution Facility and a vehicle storage building, and the construction of a Rail Classification Yard with an access control building. The project will include cybersecurity, sustainability/energy measures, building information systems, and site development. The EA for this project was finalized in February 2025. |

### *3.15.2 Potential Cumulative Impacts from the Construction and Operation of the Proposed Action*

The following analysis examines the potential cumulative impacts on the natural and human-made environment that would result from the cumulative impacts of the Proposed Action, in combination with the other actions described above. Based on the assessment of past, present, and reasonably foreseeable future actions at and in the vicinity of the Proposed Action at LEAD, a limited number of resource topics analyzed in this EA would be reasonably expected to experience cumulative impacts. These include stormwater, air quality, noise, soils, and utilities.

Together, the Proposed Action, in combination with the other construction projects listed in **Table 3-11**, could cumulatively result in an increase in air pollution; noise; and soil degradation such as compaction and erosion. However, implementation of the Proposed Action would be consistent with existing designated NAAQs regulations, noise regulations, and stormwater regulations.

The Proposed Action and other developmental projects would increase impervious areas within the area. This may lead to detrimental impacts on stormwater retention capabilities. However, the contractor would obtain all necessary stormwater management permits prior to construction to account for increased impervious surface and include stormwater management features to adequately and appropriately capture stormwater on the Proposed Action area.

The Proposed action and other developmental projects would also increase noise in the surrounding area. The fire station in particular would increase noise from fire sirens and operational noises. Construction noises from any of the projects would also increase noise. However, all projects would follow regulations including the Noise Control Act and would adhere to local noise regulations. Noise during construction would be temporary and cease upon completion of construction.

Soil erosion from the Proposed Action and other development projects would be temporary and confined to the construction phase of the projects. Soil compaction would have minor, direct, long-term adverse effects.

Vegetation could incur minor, adverse, direct, cumulative impacts. Not all the projects listed have a proposed site; but it can be assumed that some sites would include the removal of vegetation. All vegetation removal would be in accordance with the regulations listed in **Section 3.6.1.1,** including LEAD's forest management plan.

There would be no long-term adverse impacts on the remaining resource areas. Thus, all other environmental resource topics were omitted from impact analysis because temporary, negligible, or no environmental impacts would occur when considered on a cumulative basis. No significant adverse cumulative effects on any resource area would be expected from the combined effects of the proposed action and local projects.

#### *3.15.2.1 Cumulative Impacts from the No Action Alternative*

The No Action Alternative would result in no impacts. The Proposed Action area would continue to be used for agricultural purposes; therefore, it would continue to be farmed in the manner it is currently maintained with no changes to any resources. The Voelz Gate ACP would function as it currently does.

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# 4.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

As described throughout Section 4 of this EA, the construction and operation of the Proposed Action would not generate any significant adverse impacts; therefore, an EIS in not warranted.

As detailed in this EA, minor adverse impacts would result from construction activities associated with the Proposed Action. Impacts would be temporary, during the construction phase of the project. The intensity of the adverse impacts would be limited to the area immediately surrounding the Proposed Action area. These adverse impacts would end once the construction phases are completed.

During operation, long-term, minor, direct, impacts would be realized through the Proposed Action. The Proposed Action would require minor, routine operational and grounds maintenance and generally be a passive, unobtrusive land use. **Table 4-1** summarizes the potential consequences the Proposed Action and No Action Alternative would have on resources evaluated in the EA.

***Table 4-1 Summary of Environmental Consequences***

| Resource | Construction | Operation | No Action |
|---|---|---|---|
| **Land Use** | Short- and long-term, direct, moderate, adverse impact on land use due to construction staging and conversion of agricultural fields to developed land. | Long-term, minor, direct adverse effects on land use from the conversion of agricultural land to developed land. | No impact |
| **Viewshed** | Short-term, direct, minor adverse impacts due to construction staging. | Overall, long-term, direct, minor, adverse impacts from the construction of a new building in an agricultural field | No impact. |
| **Geology, Topography, and Soil** | Short-term, minor, direct adverse impacts to topography with the grading of the MMF and ACP Voelz Gate sites. No impacts to geology. Short- and long-term, moderate, direct impacts to soil from arable land conversion to developed land. | No impacts to geology or topography after construction. Long-term, moderate, direct adverse impact to soils from the conversion of arable land to compacted, non-productive land. | No impact |

| Resource | Construction | Operation | No Action |
|---|---|---|---|
| **Prime Farmland** | Long-term, moderate, direct, adverse impacts from conversion of up to 13 acres of farmland into developed land. | Long-term, minor, direct, adverse impacts from permanent soil compaction. | No impact |
| **Water Resource (Surface Water, Stormwater, Floodplains, Wetlands, and Groundwater)** | Short-term, minor, direct, adverse impacts to surface water and stormwater from sediment deposition, and conversion of permeable to impervious surface. Short-term, minor, indirect adverse impact to wetlands. Short-term, indirect, negligible, adverse impacts to groundwater from potential accidental releases of petroleum. No impacts to floodplains. | Long-term, direct, negligible, adverse impacts to surface water due to conversion of permeable land to impervious. Long-term, direct, minor, adverse impacts to stormwater due to potential increased runoff. Short-term, minor, indirect adverse impact to wetlands. No impacts to floodplains. | No impact |
| **Biological Resources (Vegetation, Wildlife, RTE)** | Overall, short-and long-term, minor, direct, adverse impacts to vegetation, wildlife, and RTEs due to removal and/or trampling, noise from construction and habitat removal, and accidental discovery or take of RTE species, respectively. | Overall, long-term, minor, direct, adverse impacts vegetation. Long-term, negligible, direct, adverse impacts to wildlife and RTEs from operational noises. | No impact |
| **Cultural Resources** | No impacts to cultural resources as no archeological sites are present. | No impact | No impact |
| **Hazardous and Toxic Materials and Waste** | Short-term, direct, minor , adverse impacts due to the use of chemicals and fuels during construction and | No impact | No impact |

| Resource | Construction | Operation | No Action |
|---|---|---|---|
| | the release of hazardous materials during demolition. | | |
| **Utilities (Potable Water, Wastewater, Energy Sources, Natural Gas, Communications, and Solid Waste)** | Long-term, minor, direct, adverse impacts due to increased demands on existing utility structures. | Long-term, minor, direct, adverse impacts due to increase utility usage | No impact |
| **Transportation and Traffic** | Short-term, minor, direct, adverse impacts to additional traffic during construction. | No impact | No impact |
| **Noise** | Short-term, minor, direct, adverse impacts due to increase in noise during construction and demolition. | Long-term, minor, direct, adverse impacts due to operational noises. | No impact |
| **Air Quality** | Short-term, minor, direct, adverse impacts from construction emissions. | Long-term, minor, direct, adverse impacts from the operation of the MMF & ACP. | No impact |
| **Human Health and Safety** | No impact | No impact | No impact |
| **Socioeconomics and Protection of Children** | Short-term, minor, direct, beneficial impacts to socioeconomics due to job creation during construction. No impact to protection of children. | No impact | No impact |
| **Cumulative Impacts** | No impact | Long-term, minor, indirect, adverse impacts from increase pollutant emissions, and increased impervious surface, noise, vegetation removal, and soil degradation. | No impact |

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# 6.0ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AIRFA | American Indian Religious Freedom Act |
| APE | Area of Potential Effect |
| ARPA | Archaeological Resources Protection Act |
| AMC | United States Army Materiel Command |
| AMSL | Above Mean Sea Level |
| ACM | Asbestos Containing Material |
| BG | Block Group |
| BRAC | Base Realignment and Closure |
| CAA | Clean Air Act |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| $CH_4$ | Methane |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| CWA | Clean Water Act |
| DA | Department of the Army |
| DDESB | DoD Explosives Safety Board |
| DESR | Defense Explosives Safety Regulation |
| DoD | Department of Defense |
| DoDI | Department of Defense Instruction |
| DNL | Day-Night Average Sound Level |
| DPW | Department of Public Works |
| EA | Environmental Assessment |
| E-ILS | Enterprise Integrated Logistics Study |
| EIS | Environmental Impact Statement |
| EISA | Energy Independence and Security Act |
| EO | Executive Order |
| ESA | Endangered Species Act |
| ESQD | Explosive Safety Quantity Distance |
| FEMA | Federal Emergency Management Agency |
| FNSI | Finding of No Significant Impact |
| FONPA | Finding of No Practicable Alternative |
| FT | Feet |
| HAP | Hazardous Air Pollutants |
| ICRMP | Integrated Cultural Resources Management Plan |
| ILS | Integrated Logistics Study |
| IPaC | Information for Planning and Conservation |
| JMC | Joint Munitions Command |
| LBP | Lead-based Paint |
| LEAD | Letterkenny Army Depot |
| LEMC | Letterkenny Munitions Center |
| LF | Linear Feet |
| LOD | Limit of Disturbance |

| | |
|---|---|
| LID | Low Impact Development |
| LTL | Less Than Truckload |
| MBTA | Migratory Bird Treaty Act |
| MMDF | Missile/Munitions Distribution Facility |
| MG/ $M^3$ | Micrograms per Meter Cubed |
| MS4 | Municipal Separate Storm Sewer System |
| NAAQS | National Ambient Air Quality Standards |
| NASA | National Aeronautics and Space Administration |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEPA | National Environmental Policy Act |
| NRHP | National Register of Historic Places |
| NPDES | National Pollutant Discharge Elimination System |
| NHPA | National Historic Preservation Act |
| NOA | Notice of Availability |
| NOI | Notice of Intent |
| NOx | Nitrogen Oxides |
| $O_3$ | Ozone |
| OSHA | Occupational Safety and Health Administration |
| PA | Programmatic Agreement |
| PFO | Palustrine Forested |
| PPM | Parts Per Million |
| PPB | Part Per Billion |
| PNDI | Pennsylvania Natural Diversity Inventory |
| RCRA | Resource Conservation and Recovery Act |
| RONA | Record of Non-Applicability |
| RTE | Rare, Threatened, and Endangered |
| SF | Square Feet |
| SIP | State Implementation Plans |
| $SO_2$ | Sulfur Dioxide |
| SHPO | State Historic Preservation Office |
| TSCA | Toxic Substance Control Act |
| U.S. | United States |
| USACE | United State Army Corps of Engineers |
| U.S.C. | United States Code |
| UFC | Unified Facilities Criteria |
| USFWS | United States Fish and Wildlife Service |
| VOC | Volatile Organic Compound |

# APPENDICES

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# Appendix A
# Agency Coordination

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**From:** thpo
**To:** Wetmore, Marisa L CIV USARMY CENAB (USA)
**Subject:** [Non-DoD Source] RE: Government to Government Consultation for an undertaking at Letterkenny Army Depot
**Date:** Tuesday, November 19, 2024 2:28:52 PM

---

Dear Marisa,

Thank you for the notice regarding the proposed undertaking at Letterkenny Munitions Center (LEMC), LEAD, Franklin County, Pennsylvania.

Though we routinely consult on such projects, Franklin County, Pennsylvania is situated outside of the Stockbridge-Munsee Community Traditional Homeland/Area of Interest. Therefore, the Stockbridge-Munsee Community Tribal Historic Preservation Office has no comment regarding the aforementioned action. For reference, please see the Stockbridge-Munsee Community Traditional Homeland/Area of Interest map at: **https://www.mohican.com/mt-content/uploads/2023/05/county-maps.pdf**.

Regards,
Jeff


Jeffrey C Bendremer Ph.D., RPA
Tribal Historic Preservation Officer
Stockbridge-Munsee Community
Tribal Historic Preservation Extension Office
86 Spring St.
Williamstown, MA 01267
413-884-6029 (o)
715-881-2254 (c)


www.mohican.com

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**From:** Wetmore, Marisa L CIV USARMY CENAB (USA) <Marisa.L.Wetmore@usace.army.mil>
**Sent:** Tuesday, November 19, 2024 7:55 AM
**To:** thpo <thpo@mohican-nsn.gov>
**Subject:** Government to Government Consultation for an undertaking at Letterkenny Army Depot

Good morning Dr. Bendremer,

On behalf of Letterkenny Army Depot (LEAD), the U.S. Army Corps of Engineers, Baltimore District (USACE), would like to initiate consultation with your Tribe regarding a new proposed undertaking at Letterkenny Munitions Center (LEMC), LEAD, Franklin County, Pennsylvania, per Section 106 of the National Historic Preservation Act (NHPA). USACE will also be preparing an Environmental Assessment (EA) for the Proposed Action, and would appreciate receiving your Tribe's early input to help LEAD identify issues for consideration regarding the Proposed Action. The proposed undertaking will include the construction of 1) Missile Maintenance Facility (MMF); and 2) Voelz Gate Access Control Point (ACP).

Please find attached a letter to initiate Government-to-Government consultation. We would appreciate any comments or questions within 30 days of receipt of this letter.

Respectfully,

Marisa Wetmore, PMP
Section Chief, Installation Support Branch
USACE Baltimore District, Planning Division
Office: 410-962-9500
Work Cell: 667-203-0149

**DEPARTMENT OF THE ARMY**
**LETTERKENNY ARMY DEPOT**
**1 OVERCASH AVENUE**
**CHAMBERSBURG, PA 17201**

November 18, 2024

SUBJECT: Section 106 Consultation Initiation for the Missile Maintenance Facility and Voelz Gate Access Control Point at Letterkenny Munitions Center, within Letterkenny Army Depot, Franklin County, Pennsylvania

Mr. Justin McKeel
Environmental Review Division Manager
Pennsylvania Historical and Museum Commission
Commonwealth Keystone Building,
Second Floor, 400 North Street
Harrisburg, PA 17120-0093
jusmckeel@pa.gov

Mr. McKeel:

We are writing to your office to initiate consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA) for a new proposed undertaking at Letterkenny Munitions Center (LEMC), Letterkenny Army Depot (LEAD), Franklin County, Pennsylvania, (Enclosure 1). The proposed undertaking will include the construction of 1) Missile Maintenance Facility (MMF); and 2) Voelz Gate Access Control Point (ACP).

The MMF includes a new missile maintenance building and additional required associated structures and buildings, described in further detail below. The Voelz Gate ACP includes demolition of the existing ACP and construction of a new, updated ACP. The project is currently in conceptual design phase, and these designs are available for your review in Enclosure 2. The proposed project constitutes a federal undertaking pursuant to the provisions of Section 106 and implementing regulations found at 36 CFR 800. A complete list of invited consulting parties for this undertaking is attached as Enclosure 5.

Project Background: The purpose of the Proposed Action is to provide an effective and efficient maintenance facility that is compliant with Ammunition and Explosives Safety Standards as well as an ACP that is compliant with Entry Control Facility Standards. Both facilities would support the Department of Defense's (DoD) new Precision Strike Missile (PrSM) mission proposed at LEMC.

The Proposed Action is needed as there are no existing facilities with the capacity or proper configuration to meet the PrSM system maintenance requirements at LEMC. Proper configuration includes the Explosive Safety Quantity-Distance Arcs (QD Arcs) required by the MMF. QD Arcs are safety buffers intended to protect explosive mission functions from encroaching upon development while also protecting life and property from explosive hazards. New habitable structures cannot exist within existing QD Arcs and new facilities with explosive hazards cannot be located such that its QD Arcs encompass existing habitable structures. Due to the nature of facilities at LEMC, many existing buildings have QD Arcs encompassing areas around them, limiting development on previously developed areas at LEMC.

Additionally, the current ACP, Voelz Gate, which is used for commercial vehicle deliveries at LEMC, is undersized and does not meet current DoD standards. In its current state, the Voelz Gate lacks sufficient space for commercial vehicles to queue prior to inspection before entering the installation.

If this project is not provided, LEMC will be unable to meet Army and DoD mission standards or requirements for 1) Ammunition and explosives safety standards compliance for maintenance facilities or 2) Entry control standards for ACPs.

The Proposed Undertaking: The MMF construction would be an estimated 32 acres and would occur on currently leased farmland on the west side of LEAD. In addition to the main missile facility, there are three additional support structures required for the PrSM mission, including an inert storage building

The Voelz Gate ACP would expand upon the existing ACP footprint. New ACP construction includes inbound and outbound vehicle lanes, queuing space for 26 vehicles, 100 parking spaces, up to three individual small buildings, and truck inspection canopies, totaling approximately 14 acres. As described above, a new ACP is required to support the PrSM mission.

To determine site suitability, a geotechnical site investigation will take place at both sites in December 2024. Enclosure 4 depicts the geotechnical drill plan that includes locations of bore holes and test pits. The borings will be about 3 inches (~3”) in diameter and will have a depth greater than 50 feet (50’) deep. The test pits will be excavated to approximately 5 feet (5’) in diameter to 5 feet (5’) in depth, or operators will excavate thinner trenches that will be less than 5 feet (5’) wide but will have depths ranging from 8 feet (8’) to 10 feet (10’).

The Area of Potential Effect (APE): The APE for the proposed undertaking will be within the limits of disturbance (LOD) for the construction and demolition activities and

those areas from which the proposed undertaking will be visible. An estimated LOD is available in Enclosure 3. The Proposed Action is still in early stages of development, no laydown areas or construction traffic routes have been identified. This information will be shared with your office when available, and the APE will be updated if needed.

Identification of Historic Properties: There are no known individually eligible historic properties identified within the APE. The archaeological site 36FR0112 (precontact and historic site) is located to the west of the MMF site. The Isaac Meyers House historic archaeological site, 36FR0341, is located to the southeast of the MMF site. Neither is located within the proposed LOD. A review of existing information on PA SHARE (PA SHPO's database) does not show any previous archaeological investigations of the LODs. The state-wide precontact probability model shows the MMF and VCP project locations as being in 'low probability' areas. LEAD is proposing to complete a Phase I archaeological investigation within the MMF and ACP LODs to identify potential historic properties.

Additionally, for the geotechnical drilling described above, an unanticipated discovery plan will be in place during the site investigation in the event archaeological materials or human remains are discovered. The data from this site investigation will inform the background research for the proposed Phase I archaeological investigation of the proposed sites.

National Environmental Policy Act (NEPA): In accordance with the National Environmental Policy Act of 1969 (42 United States Code Section 4321 et seq.), LEMC is preparing an Environmental Assessment (EA) for the Proposed Action. The EA is currently in the scoping phase, and we are including Section 106 initiation to support the cultural resources analysis within the EA.

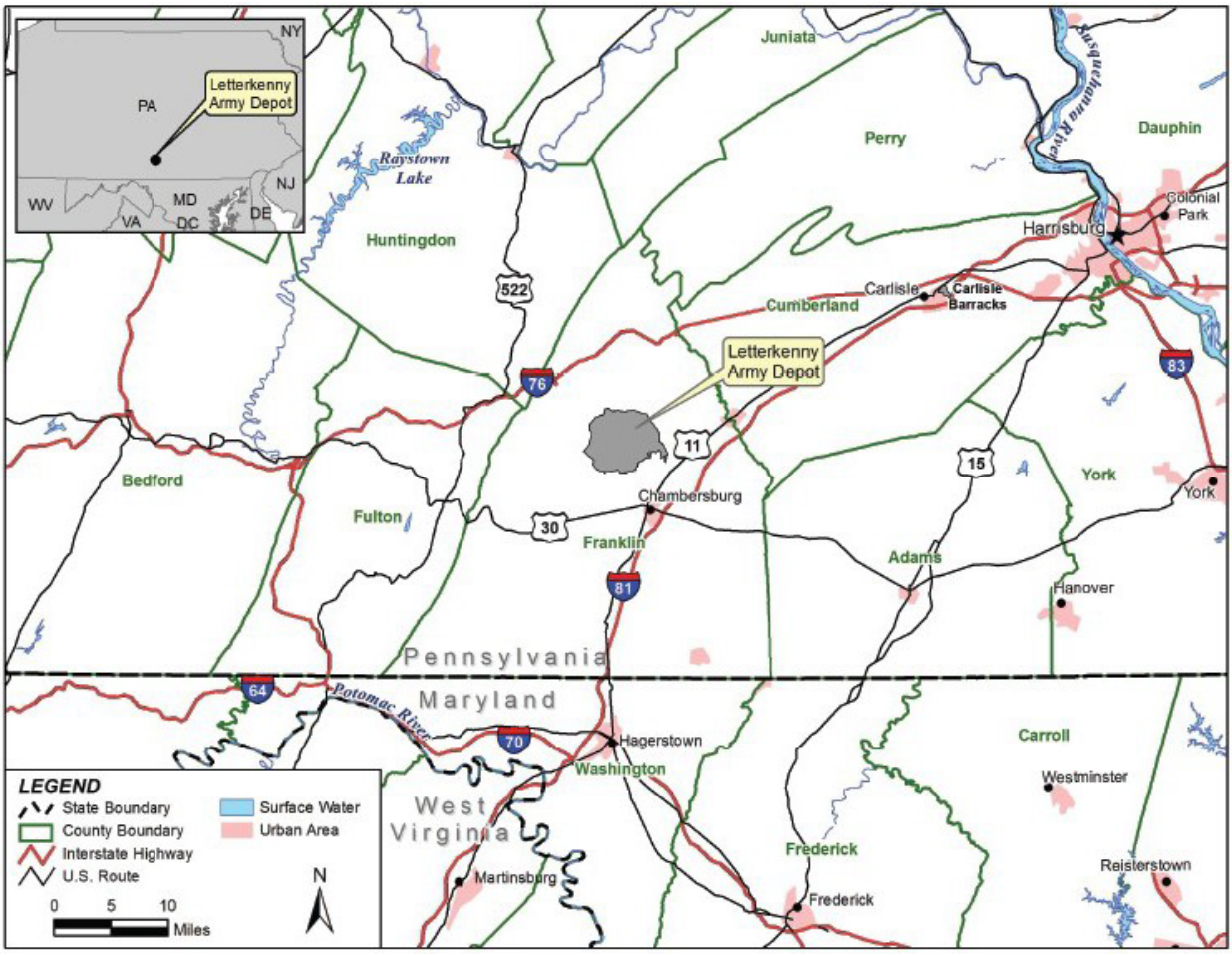
We appreciate your review and comments on the proposed undertakings. Questions regarding this undertaking should be directed to Mr. Matthew Miller, Cultural Resources Manager, at (717) 267-5702 or by email at matthew.d.miller160.civ@army.mil. An additional point of contact for this proposed undertaking is Eva Falls, Archaeologist, US Army Corps of Engineers, Baltimore District, at (410) 962-4458 or by email at eva.e.falls@usace.army.mil.

Sincerely,

Craig M. Kindlin
Chief, Environmental Division

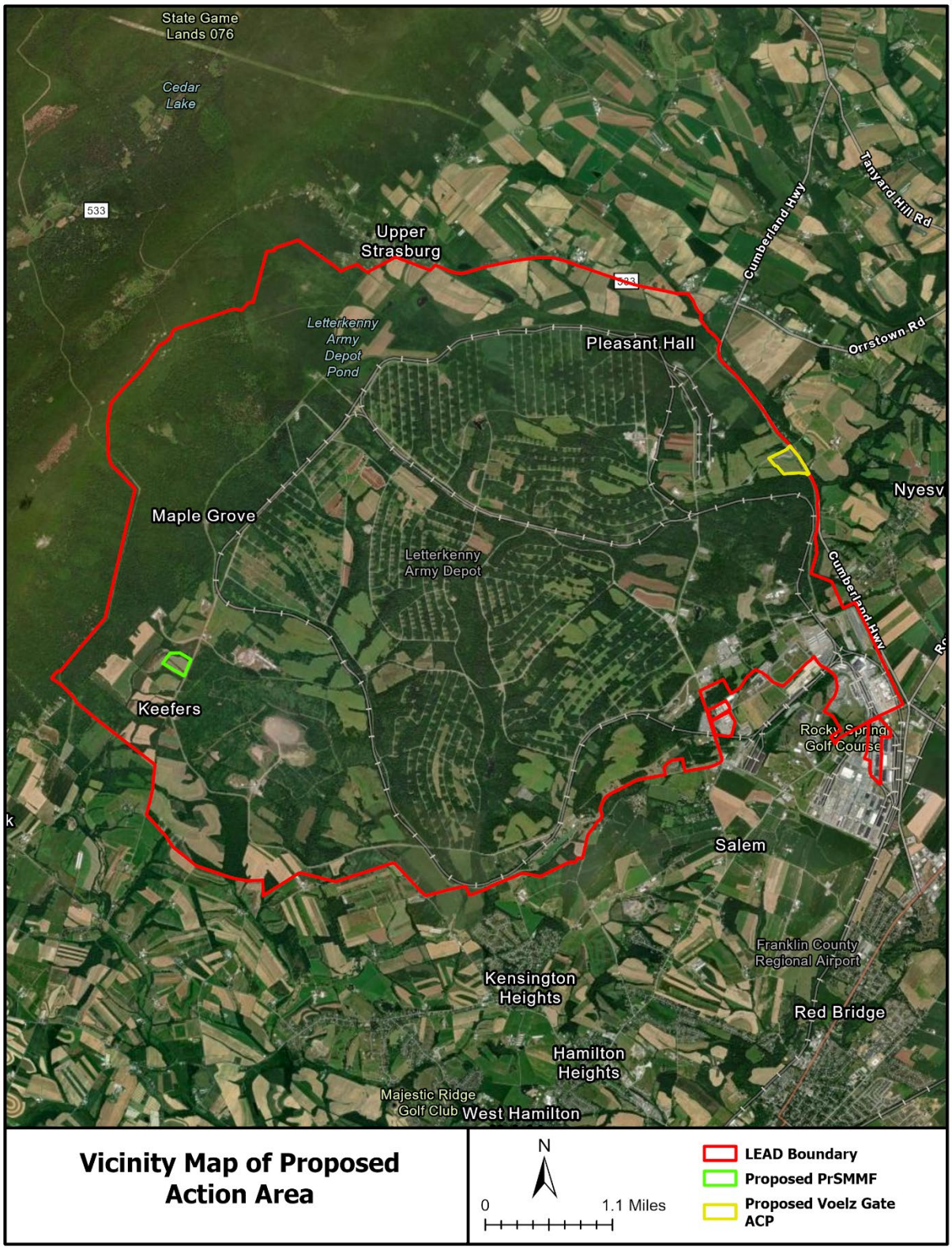
Enclosures

## Enclosure 1: Letterkenny Army Depot Location Maps




**LEAD Location**

## Enclosure 3: Proposed Project Locations



**Enclosure 5: List of Invited Consulting Parties**

**Delaware Nation**
Ms. Katelyn Lucas
Historic Preservation Officer
PO Box 825
Anadarko, OR 73005
klucas@delawarenation-nsn.gov

**Delaware Tribe of Indians**
Ms. Susan Bachor,
Deputy Director, Tribal Historic Preservation Office
126 University Circle, Stroud Hall, Room 437
East Stroudsburg, PA 18301
sbachor@delawaretribe.org

**Stockbridge Munsee Band of Mohican Indians**
Jeffrey C Bendremer Ph.D., RPA
Tribal Historic Preservation Officer
Stockbridge-Munsee Community
Tribal Historic Preservation Extension Office
86 Spring St.
Williamstown, MA 01267
thpo@mohican-nsn.gov

**Pennsylvania State Historic Preservation Office**
Mr. Justin McKeel
Environmental Review Division Manager
Pennsylvania Historical and Museum Commission
Commonwealth Keystone Building,
Second Floor, 400 North Street
Harrisburg, PA 17120-0093
jusmckeel@pa.gov

**Franklin County Historical Society**
175 East King Street
Chambersburg, PA 17201

**Shippensburg Historical Society**
PO Box 539
Shippensburg, PA 17257

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**DEPARTMENT OF THE ARMY**
**LETTERKENNY ARMY DEPOT**
**1 OVERCASH AVENUE**
**CHAMBERSBURG, PA 17201**

November 18, 2024

SUBJECT: Section 106 Consultation Initiation for the Missile Maintenance Facility and Voelz Gate Access Control Point at Letterkenny Munitions Center, within Letterkenny Army Depot, Franklin County, Pennsylvania

Ms. Katelyn Lucas
Historic Preservation Officer
PO Box 825
Anadarko, OR 73005
klucas@delawarenation-nsn.gov

Ms. Lucas:

We are writing to your office to initiate consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA) for a new proposed undertaking at Letterkenny Munitions Center (LEMC), Letterkenny Army Depot (LEAD), Franklin County, Pennsylvania, (Enclosure 1). The proposed undertaking will include the construction of 1) Missile Maintenance Facility (MMF); and 2) Voelz Gate Access Control Point (ACP).

The MMF includes a new missile maintenance building and additional required associated structures and buildings, described in further detail below. The Voelz Gate ACP includes demolition of the existing ACP and construction of a new, updated ACP. The project is currently in conceptual design phase, and these designs are available for your review in Enclosure 2. The proposed project constitutes a federal undertaking pursuant to the provisions of Section 106 and implementing regulations found at 36 CFR 800. A complete list of invited consulting parties for this undertaking is attached as Enclosure 5.

Project Background: The purpose of the Proposed Action is to provide an effective and efficient maintenance facility that is compliant with Ammunition and Explosives Safety Standards as well as an ACP that is compliant with Entry Control Facility Standards. Both facilities would support the Department of Defense's (DoD) new Precision Strike Missile (PrSM) mission proposed at LEMC.

The Proposed Action is needed as there are no existing facilities with the capacity or proper configuration to meet the PrSM system maintenance requirements at LEMC. Proper configuration includes the Explosive Safety Quantity-Distance Arcs (QD Arcs) required by the MMF. QD Arcs are safety buffers intended to protect explosive mission functions from encroaching upon development while also protecting life and property from explosive hazards. New habitable structures cannot exist within existing QD Arcs and new facilities with explosive hazards cannot be located such that its QD Arcs encompass existing habitable structures. Due to the nature of facilities at LEMC, many existing buildings have QD Arcs encompassing areas around them, limiting development on previously developed areas at LEMC.

Additionally, the current ACP, Voelz Gate, which is used for commercial vehicle deliveries at LEMC, is undersized and does not meet current DoD standards. In its current state, the Voelz Gate lacks sufficient space for commercial vehicles to queue prior to inspection before entering the installation.

If this project is not provided, LEMC will be unable to meet Army and DoD mission standards or requirements for 1) Ammunition and explosives safety standards compliance for maintenance facilities or 2) Entry control standards for ACPs.

The Proposed Undertaking: The MMF construction would be an estimated 32 acres and would occur on currently leased farmland on the west side of LEAD. In addition to the main missile facility, there are three additional support structures required for the PrSM mission, including an inert storage building.

The Voelz Gate ACP would expand upon the existing ACP footprint. New ACP construction includes inbound and outbound vehicle lanes, queuing space for 26 vehicles, 100 parking spaces, up to three individual small buildings, and truck inspection canopies, totaling approximately 14 acres. As described above, a new ACP is required to support the PrSM mission.

To determine site suitability, a geotechnical site investigation will take place at both sites in December 2024. Enclosure 4 depicts the geotechnical drill plan that includes locations of bore holes and test pits. The borings will be about 3 inches (~3”) in diameter and will have a depth greater than 50 feet (50’) deep. The test pits will be excavated to approximately 5 feet (5’) in diameter to 5 feet (5’) in depth, or operators will excavate thinner trenches that will be less than 5 feet (5’) wide but will have depths ranging from 8 feet (8’) to 10 feet (10’).

The Area of Potential Effect (APE): The APE for the proposed undertaking will be within the limits of disturbance (LOD) for the construction and demolition activities and those areas from which the proposed undertaking will be visible. An estimated LOD is available in Enclosure 3. The Proposed Action is still in early stages of development, no

laydown areas or construction traffic routes have been identified. This information will be shared with your office when available, and the APE will be updated if needed.

Identification of Historic Properties: There are no known individually eligible historic properties identified within the APE. The archaeological site 36FR0112 (precontact and historic site) is located to the west of the MMF site. The Isaac Meyers House historic archaeological site, 36FR0341, is located to the southeast of the MMF site. Neither is located within the proposed LOD. A review of existing information on PA SHARE (PA SHPO's database) does not show any previous archaeological investigations of the LODs. The state-wide precontact probability model shows the MMF and VCP project locations as being in 'low probability' areas. LEAD is proposing to complete a Phase I archaeological investigation within the MMF and ACP LODs to identify potential historic properties.

Additionally, for the geotechnical drilling described above, an unanticipated discovery plan will be in place during the site investigation in the event archaeological materials or human remains are discovered. The data from this site investigation will inform the background research for the proposed Phase I archaeological investigation of the proposed sites.

National Environmental Policy Act (NEPA): In accordance with the National Environmental Policy Act of 1969 (42 United States Code Section 4321 et seq.), LEMC is preparing an Environmental Assessment (EA) for the Proposed Action. The EA is currently in the scoping phase, and we are including Section 106 initiation to support the cultural resources analysis within the EA.

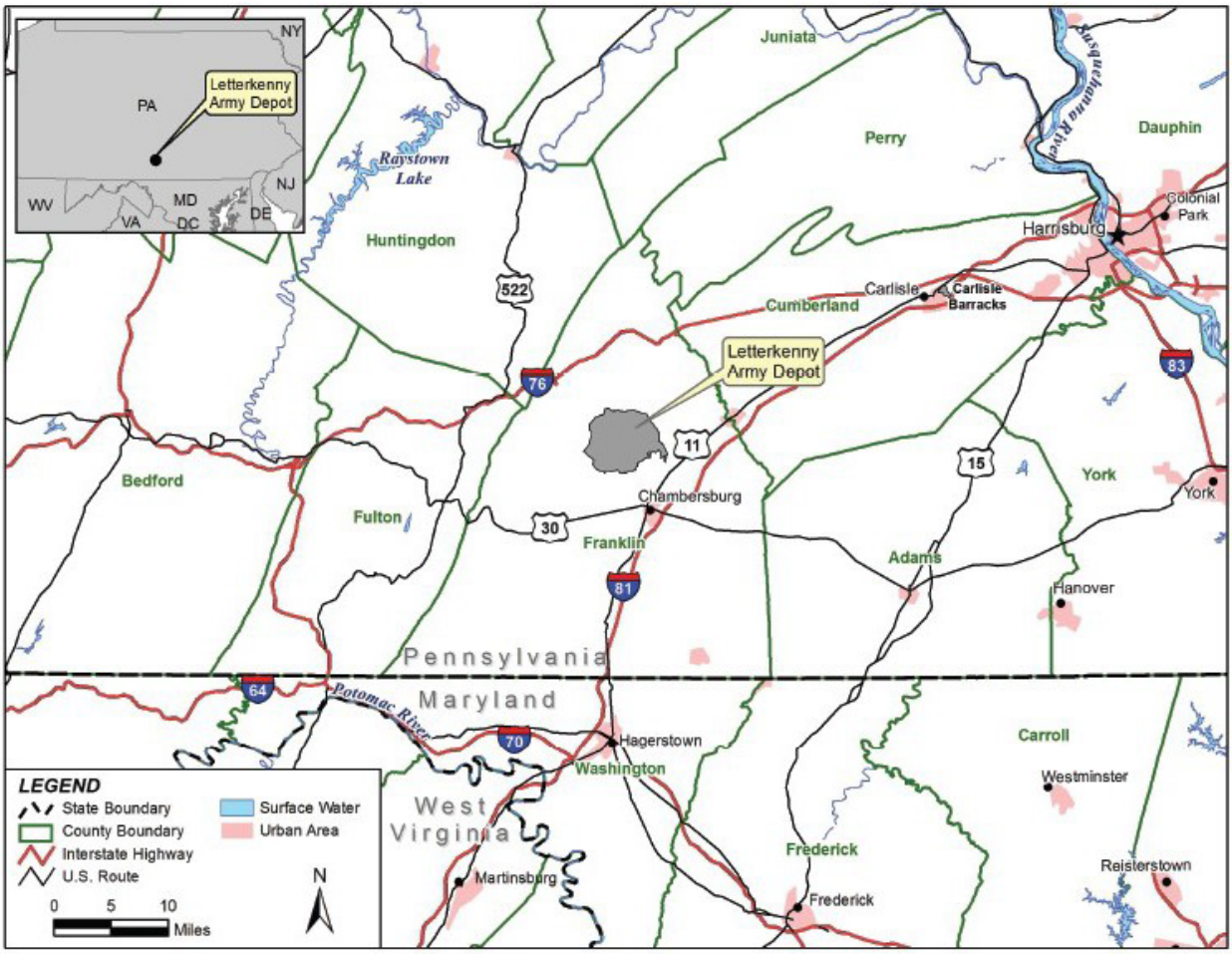
We appreciate your review and comments on the proposed undertakings. Questions regarding this undertaking should be directed to Mr. Matthew Miller, Cultural Resources Manager, at (717) 267-5702 or by email at matthew.d.miller160.civ@army.mil. An additional point of contact for this proposed undertaking is Eva Falls, Archaeologist, US Army Corps of Engineers, Baltimore District, at (410) 962-4458 or by email at eva.e.falls@usace.army.mil.

Sincerely,

Craig M. Kindlin
Chief, Environmental Division

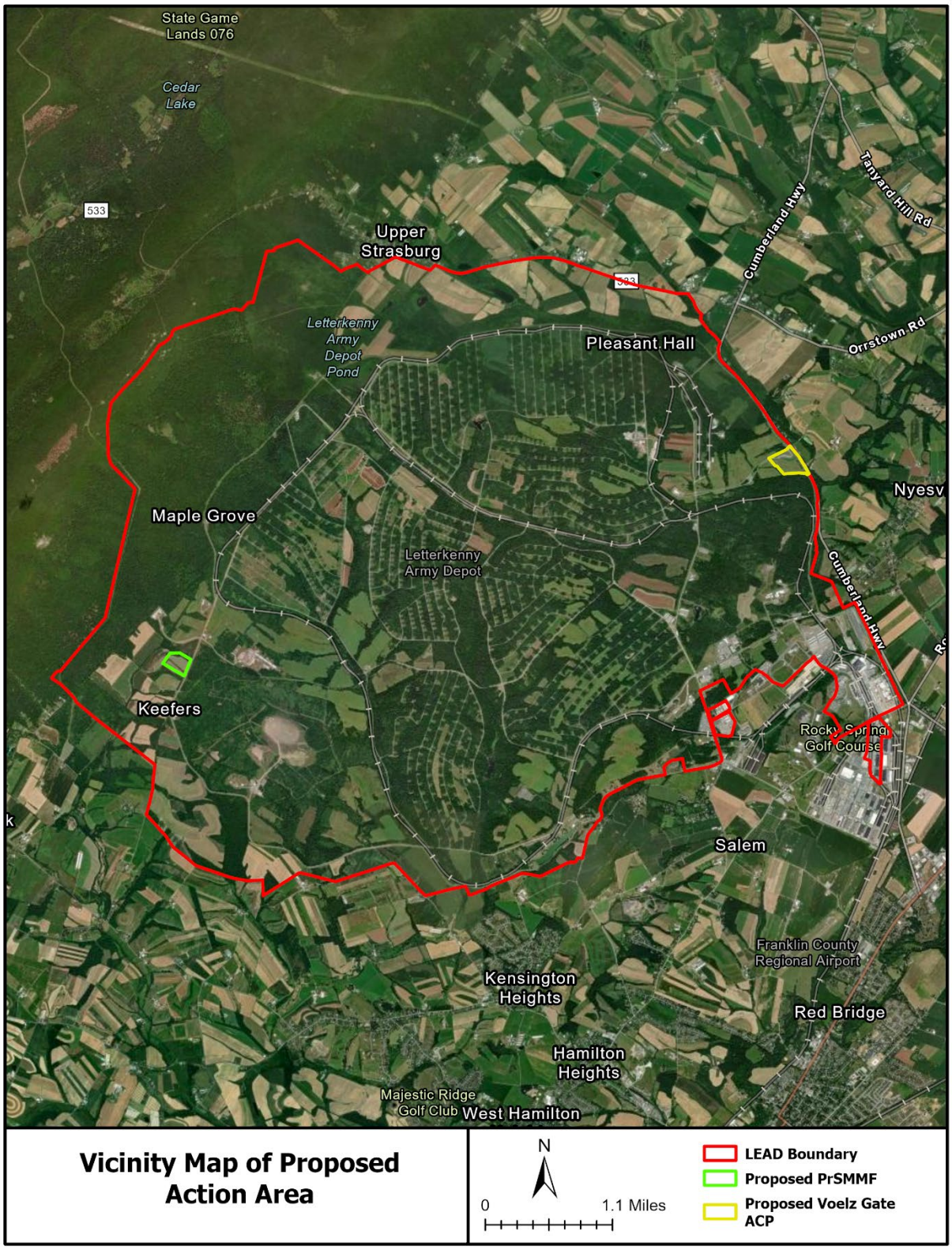
Enclosures

## Enclosure 1: Letterkenny Army Depot Location Maps




**LEAD Location**

## Enclosure 3: Proposed Project Locations



**Enclosure 5: List of Invited Consulting Parties**

**Delaware Nation**
Ms. Katelyn Lucas
Historic Preservation Officer
PO Box 825
Anadarko, OR 73005
klucas@delawarenation-nsn.gov

**Delaware Tribe of Indians**
Ms. Susan Bachor,
Deputy Director, Tribal Historic Preservation Office
126 University Circle, Stroud Hall, Room 437
East Stroudsburg, PA 18301
sbachor@delawaretribe.org

**Stockbridge Munsee Band of Mohican Indians**
Jeffrey C Bendremer Ph.D., RPA
Tribal Historic Preservation Officer
Stockbridge-Munsee Community
Tribal Historic Preservation Extension Office
86 Spring St.
Williamstown, MA 01267
thpo@mohican-nsn.gov

**Pennsylvania State Historic Preservation Office**
Mr. Justin McKeel
Environmental Review Division Manager
Pennsylvania Historical and Museum Commission
Commonwealth Keystone Building,
Second Floor, 400 North Street
Harrisburg, PA 17120-0093
jusmckeel@pa.gov

**Franklin County Historical Society**
175 East King Street
Chambersburg, PA 17201

**Shippensburg Historical Society**
PO Box 539
Shippensburg, PA 17257

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

December 12, 2024

*Sent Via PA-SHARE*

RE: ER Project # 2024PR05401.001, Missile Maintenance Facility and Voelz Gate Access Control Point, Department of Defense, Letterkenny Township, Franklin County

Dear Submitter,

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

**Above Ground Resources**
*Above Ground Concerns - Environmental Review - No Effect - Above Ground*

Based on the information received and available within our files, it is our opinion that the proposed project will have No Effect on above ground historic properties, including historic buildings, districts, structures, and/or objects, should they exist. Should the scope of the project change and/or should you be made aware of historic property concerns, you will need to reinitiate consultation with our office using PA-SHARE.

For questions concerning above ground resources, please contact Tyra Guyton at tyguyton@pa.gov.

**Archaeological Resources**
*More Information Requested - Environmental Review - More Info Archaeological - High Prob*

Based on an evaluation by our staff, there is a high probability that National Register-eligible archaeological sites are present within this project area. These sites could be adversely affected by project activities. Our review considers the locations of known archaeological resources, the Statewide Pre-Contact Predictive Model, soil type, topographic setting, slope direction and distance to water, among other regionally specific predictive factors for archaeological site locations. We concur that a Phase I archaeological survey should be conducted to locate potentially significant resources. Guidelines and instructions for conducting all phases of archaeological survey in Pennsylvania are available on our website.

*More Information Requested - New Survey*

Please use this request for information to enter survey details, add any identified archaeological sites, and upload the Phase I archaeological survey report. Please submit the requested materials to the PA SHPO through PA-SHARE using the link under SHPO Requests More Information on the Response screen.

For questions concerning archaeological resources, please contact Justin McKeel at jusmckeel@pa.gov.

Sincerely,

Barbara Frederick
Environmental Review Division Manager

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# Appendix B
# Information for Planning and Consultation (IPaC) Report

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 07/30/2025 19:53:23 UTC
Project code: 2025-0129198
Project Name: LEAD MMF & Volez Gate LOD Update

Federal Nexus: yes
Federal Action Agency (if applicable): Army

**Subject:** Federal agency coordination under the Endangered Species Act, Section 7 for 'LEAD MMF & Volez Gate LOD Update'

Dear Lauren Joyal:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on July 30, 2025, for 'LEAD MMF & Volez Gate LOD Update' (here forward, Project). This project has been assigned Project Code 2025-0129198 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

**Ensuring Accurate Determinations When Using IPaC**

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your Project, the Project may need to apply the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office.***

**Determination for the Northern Long-Eared Bat and Tricolored Bat**

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

| Species | Listing Status | Determination |
|---|---|---|
| Northern Long-eared Bat (*Myotis septentrionalis*) | Endangered | NLAA |
| Tricolored Bat (*Perimyotis subflavus*) | Proposed Endangered | May affect |

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete for northern long-eared bat and/or tricolored bat and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat or tricolored bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat or tricolored bat that was not considered when completing the determination key.

**15-Day Review Period**

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat and/or tricolored bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat and Tricolored Bat DKey.

**Other Species and Critical Habitat that May be Present in the Action Area**

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Indiana Bat *Myotis sodalis* Endangered
- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Northeastern Bulrush *Scirpus ancistrochaetus* Endangered

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Pennsylvania Ecological Services Field Office and reference Project Code 2025-0129198 associated with this Project.

**Action Description**
You provided to IPaC the following name and description for the subject Action.

**1. Name**

LEAD MMF & Volez Gate LOD Update

**2. Description**

The following description was provided for the project 'LEAD MMF & Volez Gate LOD Update':

> The total construction for the MMF is an estimated 16 acres of disturbance on the northeastern edge of LEMC.
> The Voelz Gate ACP includes the demolition of the existing ACP and the construction of a new ACP. 32 acres. This an update to a previous submissions which concluded, after consultation, NLAA. The project area on the east, the easternmost tail is the LOD addition.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.03238105,-77.64526986024228,14z

# DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of "may affect, but not likely to adversely affect" for a least one species covered by this determination key.

## QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   **Note:** Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   *No*

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   **Automatically answered**
   *No*

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

   **Automatically answered**
   *No*

4. Does the proposed action involve wind or solar energy?

   *No*

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   **Note for projects in Pennsylvania**: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer 'yes' to this question.

   *Yes*

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   *No*

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   **Note:** This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   *Yes*

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   *No*

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   *No*

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**

    *No*

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

    *No*

12. Does the action area contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs?

    *No*

13. Will the action cause effects to a bridge?

    **Note:** Covered bridges should be considered as bridges in this question.

    *No*

14. Will the action result in effects to a culvert or tunnel at any time of year?

    *No*

15. Are trees present within 1000 feet of the action area?

    **Note:** If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

16. Does the action include the intentional exclusion of bats from a building or building-like structure? **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    *No*

17. Does the action involve removal, modification, or maintenance of a human-made building-like structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    *No*

18. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    *No*

19. Will the action include or cause any construction or other activity that is reasonably certain to increase average night-time traffic permanently or temporarily on one or more existing roads? **Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    *Yes*

20. Will the increased vehicle traffic occur on any road that lies between any two areas of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

    **Note:** "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

    *No*

21. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    **Note:** For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    *No*

22. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    *No*

23. Will the action include drilling or blasting?

    *No*

24. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    *No*

25. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    *No*

26. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *No*

27. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

28. Will the action cause an increase in the extent of suitable forested habitat exposed to artificial lighting?

    *No*

29. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    *No*

30. Will the proposed action result in the use of prescribed fire?

    **Note:** If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

    *Yes*

31. Will the prescribed fire affect suitable summer habitat for the northern long-eared bat and/or tricolored bat?

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

32. [Semantic] Does the action area intersect with the western prescribed fire range for the northern long-eared bat and/or tricolored bat?

    **Automatically answered**
    *No*

33. Will the prescribed fire prescription include average flame length of > 8 feet?

    *No*

34. Will **ANY** prescribed fire occur when temperatures are < 40 degrees Fahrenheit?

    *No*

35. Will any prescribed fire occur during the pup season for the northern long-eared bat and/or tricolored bat? **Note:** Bat activity periods for your state can be found in Appendix 2 of the Service's Northern Long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects.

    *No*

36. Does the action area intersect the northern long-eared bat species list area?

    **Automatically answered**
    *Yes*

37. [Semantic] Is the action area located within 0.5 miles of radius of an entrance/opening to any known NLEB hibernacula? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

38. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

39. [Semantic] Is the action area located within 150 feet of a documented northern long-eared bat roost site?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.Have you contacted the appropriate agency to determine if your action is within 150 feet of any documented northern long-eared bat roosts?

    Note: A document with links to Natural Heritage Inventory databases and other state-specific sources of information on the locations of northern long-eared bat roosts is available here. Location information for northern long-eared bat roosts is generally kept in state natural heritage inventory databases – the availability of this data varies by state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited.

    **Automatically answered**
    *No*

40. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
    If unsure, answer "Yes."

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

41. Does the action area intersect the tricolored bat species list area?

    **Automatically answered**
    *Yes*

42. [Semantic] Is the action area located within 0.5 miles of radius of an entrance/opening to any known tricolored bat hibernacula? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

43. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

44. Has a presence/probable absence bat survey targeting the tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area?

    *No*

45. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?
    (If unsure, answer ""Yes."")

    **Note:** If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (Tillandsia usneoides), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines.

    *Yes*

46. Do you have any documents that you want to include with this submission?

    *No*

# PROJECT QUESTIONNAIRE

# IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Lauren Joyal
Address: 2 Hopkins Plaza
City: Baltimore
State: MD
Zip: 21201
Email joyall@umich.edu
Phone: 8128782281

# LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 07/30/2025 19:46:58 UTC
Project Code: 2025-0129198
Project Name: LEAD MMF & Volez Gate LOD Update

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

- USFWS National Wildlife Refuges and Fish Hatcheries

# OFFICIAL SPECIES LIST

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

This species list is provided by:

**Pennsylvania Ecological Services Field Office**
110 Radnor Road Suite 101
State College, PA 16801-7987
(814) 234-4090

# PROJECT SUMMARY

Project Code: 2025-0129198
Project Name: LEAD MMF & Volez Gate LOD Update
Project Type: Military Development
Project Description: The total construction for the MMF is an estimated 16 acres of disturbance on the northeastern edge of LEMC.
The Voelz Gate ACP includes the demolition of the existing ACP and the construction of a new ACP. 32 acres

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.03238105,-77.64526986024228,14z


Counties: Franklin County, Pennsylvania

# ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

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

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

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

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

## MAMMALS

| NAME | STATUS |
|---|---|
| Indiana Bat *Myotis sodalis*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/5949 | Endangered |
| Northern Long-eared Bat *Myotis septentrionalis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9045 | Endangered |
| Tricolored Bat *Perimyotis subflavus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/10515 | Proposed Endangered |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Proposed Threatened |

## FLOWERING PLANTS

| NAME | STATUS |
|---|---|
| Northeastern Bulrush *Scirpus ancistrochaetus*<br>Population:<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/6715 | Endangered |

## CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

## IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Lauren Joyal
Address: 2 Hopkins Plaza
City: Baltimore
State: MD
Zip: 21201
Email joyall@umich.edu
Phone: 8128782281

## LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 08/01/2025 18:36:20 UTC
Project code: 2025-0129198
Project Name: LEAD MMF & Volez Gate LOD Update

Federal Nexus: yes
Federal Action Agency (if applicable): Army

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'LEAD MMF & Volez Gate LOD Update'

Dear Lauren Joyal:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on August 01, 2025, for “LEAD MMF & Volez Gate LOD Update” (here forward, Project). This project has been assigned Project Code 2025-0129198 and all future correspondence should clearly reference this number.

The Service developed the IPaC system and associated species’ determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northeast Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative effect(s)), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17). Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no further consultation with, or concurrence from, the Service is

required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13]).

The IPaC results indicated the following species is (are) potentially present in your project area and, based on your responses to the Service's Northeast DKey, you determined the proposed Project will have the following effect determinations:

| Species | Listing Status | Determination |
|---|---|---|
| Indiana Bat (*Myotis sodalis*) | Endangered | No effect |
| Northeastern Bulrush (*Scirpus ancistrochaetus*) | Endangered | No effect |

**Conclusion** If there are no updates on listed species, no further consultation/coordination for this project is required for the species identified above. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project implements any changes which are final or commits additional resources.

**Other Species and Critical Habitat that May be Present in the Action Area**

In addition to the species listed above, the following species and/or critical habitats may also occur in your project area and are not covered by this conclusion:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Northern Long-eared Bat *Myotis septentrionalis* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

Please Note: If the Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) by the prospective permittee may be required. Please contact the Migratory Birds Permit Office, (413) 253-8643, or PermitsR5MB@fws.gov, with any questions regarding potential impacts to Eagles.

If you have any questions regarding this letter or need further assistance, please contact the Pennsylvania Ecological Services Field Office and reference the Project Code associated with this Project.

**Action Description**
You provided to IPaC the following name and description for the subject Action.

**1. Name**

LEAD MMF & Volez Gate LOD Update

**2. Description**

The following description was provided for the project 'LEAD MMF & Volez Gate LOD Update':

> The total construction for the MMF is an estimated 16 acres of disturbance on the northeastern edge of LEMC.
> The Voelz Gate ACP includes the demolition of the existing ACP and the construction of a new ACP. 32 acres. This an update to a previous submissions which concluded, after consultation, NLAA. The project area on the east, the easternmost tail is the LOD addition.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.03238105,-77.64526986024228,14z

# QUALIFICATION INTERVIEW

1. As a representative of this project, do you agree that all items submitted represent the complete scope of the project details and you will answer questions truthfully?

   *Yes*

2. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed species?

   **Note:** This question could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered, or proposed species.

   *No*

3. Does the proposed action involve wind or solar energy?

   *No*

4. Is the action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   **Note:** for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer ‘yes’ to this question.

   *Yes*

5. Are you including in this analysis all impacts to federally listed species that may result from the entirety of the project (not just the activities under federal jurisdiction)?

   **Note:** If there are project activities that will impact listed species that are considered to be outside of the jurisdiction of the federal action agency submitting this key, contact your local Ecological Services Field Office to determine whether it is appropriate to use this key. If your Ecological Services Field Office agrees that impacts to listed species that are outside the federal action agency's jurisdiction will be addressed through a separate process, you can answer yes to this question and continue through the key.

   *Yes*

6. Are you the lead federal action agency or designated non-federal representative requesting concurrence on behalf of the lead Federal Action Agency?

   *Yes*

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)?

   *No*

8. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   *No*

9. Is the lead federal action agency the Natural Resources Conservation Service?

   *No*

10. Will the proposed project involve the use of herbicide where listed species are present?

    *No*

11. Will the proposed project involve herbaceous native vegetation removal (including prescribed fire that would result in burning of plants) or mowing?

    *No*

12. Will all activities occur within an area that is currently paved, graveled, routinely maintained lawn, and/or inside a structure?

    *No*

13. Does any component of the project associated with this action include activities or structures that may pose a collision risk to **birds** (e.g., plane-based surveys, communication towers, high voltage transmission lines, any type of towers with or without guy wires)?

    *No*

14. Will the proposed project involve earth moving or other ground disturbance that could cause erosion and sedimentation, and/or contamination within 300 feet of a freshwater wetland or along a stream or tributary of a stream where listed species may be present?

    **Note**: Answer "Yes" to this question if erosion and sediment control measures will be used.

    *Yes*

15. Will the proposed project impact streams or tributaries of streams where listed species may be present through activities such as, but not limited to, valley fills, large-scale vegetation removal that could result in ground destabilization, and/or change in site topography?

    *No*

16. Will the proposed project involve vegetation removal within 200 feet of a perennial stream bank where aquatic listed species may be present?

    *No*

17. Will erosion and sedimentation control Best Management Practices (BMPs) associated with applicable state and/or Federal permits, be applied to the project?

    **Note:** If BMPs have been provided by and/or coordinated with and approved by the appropriate Ecological Services Field Office, answer "Yes" to this question.

    *Yes*

18. Is the project being funded, lead, or managed in whole or in part by U.S Fish and Wildlife Restoration and Recovery Program (e.g., Partners, Coastal, Fisheries, Wildlife and Sport Fish Restoration, Refuges)?

    *No*

19. Does the proposed project involve construction or installation of a non-commercial boat dock on a stream?

    *No*

20. Does any component of the project associated with this action include activities or structures that may pose a collision risk to **bats** (e.g., plane-based surveys)?

    *No*

21. Will the proposed project result in permanent changes to surface water or groundwater quantity, retention, quality or timing in areas where **bats** may be present?

    *No*

22. Will the proposed project affect wetlands in areas where **bats** may be present?

    *No*

23. Will the proposed project involve blasting where bats may be present?

    *No*

24. Does the project intersect the Indiana bat species list area?

    **Automatically answered**
    *Yes*

25. Are there any caves or anthropogenic features that are suitable for hibernating or roosting Indiana bats within the area expected to be impacted by the project ?

    *No*

26. Are trees present within the action area?

    **Note:** If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥5 inches dbh (12.7 centimeter), answer "Yes". If you are unsure, answer “Yes.” Or refer to Appendix A of the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines for definitions and an assessment form that will assist you in determining if suitable habitat is present within your project's action area. Suitable summer habitat for Indiana bat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh (12.7 centimeter) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat.

    *Yes*

27. Has a presence/probable absence bat survey following the Service’s Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines been conducted within the action area?

    *No*

28. Does the project involve removal or modification of a human-made structure (barn, house, or other building) known or suspected to contain roosting bats? **Note:** Most maintenance and general human disturbance in and around structures will not affect Indiana bats as bats roosting in human structures are adjusted to a certain level of routine noise and are generally expected to roost away from areas with excessive disturbance. Answer 'no' if the proposed action will not include disturbance to human structures known or suspected to contain roosting bats or if the structure does not offer suitable roosting habitat for northern long-eared bats. If unsure, answer 'yes.'

    *No*

29. Does the project include removal/modification of an existing bridge or culvert?

    *No*

30. Will the project include tree cutting, other means of knocking down or bringing down trees, or tree trimming?

    *No*

31. Will the project result in the use of prescribed fire?

    *No*

32. Does the project include temporary or permanent lighting of roadway(s), facility(ies), and/or parking lot(s)?

    *Yes*

33. When installing new or replacing existing permanent lights, will downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting) be used?

    *Yes*

34. Will temporary lighting be directed away from suitable Indiana bat habitat during the active season?

    *Yes*

35. Does the project intersect the northeastern bulrush species list area?

    **Automatically answered**
    *Yes*

36. Do you have any other documents that you want to include with this submission?

    *No*

# PROJECT QUESTIONNAIRE

1. Approximately how many acres of trees would the proposed project remove?

   *0.5*

2. Approximately how many total acres of disturbance are within the disturbance/ construction limits of the proposed project?

   *32*

3. Briefly describe the habitat within the construction/disturbance limits of the project site.

   *Both site are active farm fields. The western site has a tree line that separates two fields that would be removed. The eastern site is an active gate for LEAD that would be demolished and rebuilt, partially on an active farm field.*

# IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Lauren Joyal
Address: 2 Hopkins Plaza
City: Baltimore
State: MD
Zip: 21201
Email joyall@umich.edu
Phone: 8128782281

# LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 08/01/2025 18:47:21 UTC
Project code: 2025-0129198
Project Name: LEAD MMF & Volez Gate LOD Update

Federal Nexus: yes
Federal Action Agency (if applicable): Army

**Subject:** Federal agency coordination under the Endangered Species Act, Section 7 for 'LEAD MMF & Volez Gate LOD Update'

Dear Lauren Joyal:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on August 01, 2025, for 'LEAD MMF & Volez Gate LOD Update' (here forward, Project). This project has been assigned Project Code 2025-0129198 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

**Ensuring Accurate Determinations When Using IPaC**

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Note that conservation measures for northern long-eared bat and tricolored bat may differ. If both bat species are present in the action area and the key suggests more conservative measures for one of the species for your Project, the Project may need to apply the most conservative measures in order to avoid adverse effects. If unsure which conservation measures should be applied, please contact the appropriate Ecological Services Field Office.***

**Determination for the Northern Long-Eared Bat and Tricolored Bat**

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

| Species | Listing Status | Determination |
|---|---|---|
| Northern Long-eared Bat (*Myotis septentrionalis*) | Endangered | NLAA |
| Tricolored Bat (*Perimyotis subflavus*) | Proposed Endangered | May affect |

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate.

Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete for northern long-eared bat and/or tricolored bat and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat or tricolored bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat or tricolored bat that was not considered when completing the determination key.

**15-Day Review Period**

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat and/or tricolored bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat and Tricolored Bat DKey.

**Other Species and Critical Habitat that May be Present in the Action Area**

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Indiana Bat *Myotis sodalis* Endangered
- Monarch Butterfly *Danaus plexippus* Proposed Threatened
- Northeastern Bulrush *Scirpus ancistrochaetus* Endangered

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Pennsylvania Ecological Services Field Office and reference Project Code 2025-0129198 associated with this Project.

**Action Description**
You provided to IPaC the following name and description for the subject Action.

**1. Name**

LEAD MMF & Volez Gate LOD Update

**2. Description**

The following description was provided for the project 'LEAD MMF & Volez Gate LOD Update':

> The total construction for the MMF is an estimated 16 acres of disturbance on the northeastern edge of LEMC.
> The Voelz Gate ACP includes the demolition of the existing ACP and the construction of a new ACP. 32 acres. This an update to a previous submissions which concluded, after consultation, NLAA. The project area on the east, the easternmost tail is the LOD addition.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.03238105,-77.64526986024228,14z

# DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of "may affect, but not likely to adversely affect" for a least one species covered by this determination key.

## QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   **Note:** Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   *No*

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   **Automatically answered**
   *No*

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

   **Automatically answered**
   *No*

4. Does the proposed action involve wind or solar energy?

   *No*

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   **Note for projects in Pennsylvania**: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer 'yes' to this question.

   *Yes*

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   *No*

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   **Note:** This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   *Yes*

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   *No*

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   *No*

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**

    *No*

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

    *No*

12. Does the action area contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs?

    *No*

13. Will the action cause effects to a bridge?

    **Note:** Covered bridges should be considered as bridges in this question.

    *No*

14. Will the action result in effects to a culvert or tunnel at any time of year?

    *No*

15. Are trees present within 1000 feet of the action area?

    **Note:** If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

16. Does the action include the intentional exclusion of bats from a building or building-like structure? **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    *No*

17. Does the action involve removal, modification, or maintenance of a human-made building-like structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    *No*

18. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    *No*

19. Will the action include or cause any construction or other activity that is reasonably certain to increase average night-time traffic permanently or temporarily on one or more existing roads? **Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    *No*

20. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    *Yes*

21. Will the new travel lanes lie between any two patches of contiguous forest that are each greater than or equal to 10 acres in extent and separated by less than 1,000 feet? Bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

    **Note:** "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

    *No*

22. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    **Note:** For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    *No*

23. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    *No*

24. Will the action include drilling or blasting?

    *No*

25. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    *No*

26. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    *No*

27. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *No*

28. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

29. Will the action cause an increase in the extent of suitable forested habitat exposed to artificial lighting?

    *No*

30. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    *Yes*

31. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

    *No*

32. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    **Note:** A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

    *No*

33. Does the project intersect with the 0- 9.9% forest density category?

    **Automatically answered**
    *No*

34. Does the project intersect with the 10.0- 19.9% forest density category map?

    **Automatically answered**
    *Yes*

35. Does the project intersect with the 20.0- 29.9% forest density category map?

    **Automatically answered**
    *No*

36. Does the project intersect with the 30.0- 100% forest density category map?

    **Automatically answered**
    *Yes*

37. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 5 acres in total extent?

    *No*

38. Will the proposed action result in the use of prescribed fire?

    **Note:** If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

    *No*

39. Does the action area intersect the northern long-eared bat species list area?

    **Automatically answered**
    *Yes*

40. [Semantic] Is the action area located within 0.5 miles of radius of an entrance/opening to any known NLEB hibernacula? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

41. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

42. [Semantic] Is the action area located within 150 feet of a documented northern long-eared bat roost site?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.Have you contacted the appropriate agency to determine if your action is within 150 feet of any documented northern long-eared bat roosts?

    Note: A document with links to Natural Heritage Inventory databases and other state-specific sources of information on the locations of northern long-eared bat roosts is available here. Location information for northern long-eared bat roosts is generally kept in state natural heritage inventory databases – the availability of this data varies by state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited.

    **Automatically answered**
    *No*

43. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
    If unsure, answer "Yes."

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *Yes*

44. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    *No*

45. Does the action area intersect the tricolored bat species list area?

    **Automatically answered**
    *Yes*

46. [Semantic] Is the action area located within 0.5 miles of radius of an entrance/opening to any known tricolored bat hibernacula? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

47. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

48. Has a presence/probable absence bat survey targeting the tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area?

    *No*

49. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?
    (If unsure, answer ""Yes."")

    **Note:** If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (Tillandsia usneoides), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines.

    *Yes*

50. Do you have any documents that you want to include with this submission?

    *No*

# PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

*0.5*

# IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Lauren Joyal
Address: 2 Hopkins Plaza
City: Baltimore
State: MD
Zip: 21201
Email joyall@umich.edu
Phone: 8128782281

# LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army

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**Introduction**

This Conservation Planning Report compiles names, descriptions, maps, locations, measurements, links and references for Natural Heritage Areas (core and supporting habitats), Important Bird Areas, State Lands, and agency designated water resources that are coincident with an area of interest defined by the user of the Pennsylvania Conservation Explorer tool. For an overview and additional details, please be sure to visit the website at www.naturalheritage.state.pa.us and download the applicable County Natural Heritage Inventory report(s).

**Site Area:** 23,013.49 acres
**County(s):** Franklin
**Township/Municipality(s):** Greene Township; Hamilton Township; Letterkenny Township
**Quadrangle Name(s):** CHAMBERSBURG; FANNETTSBURG; ROXBURY; SAINT THOMAS
**Watersheds HUC 8:** Conococheague-Opequon; Lower Susquehanna-Swatara
**Watersheds HUC 12:** Dennis Creek-Back Creek; Lehman Run-Muddy Run; Mountain Creek-Conococheague Creek; Rocky Spring Branch; Rowe Run; Trout Run-Conodoguinet Creek
**Decimal Degrees:** 40.019245 N, -77.702297 W
**Degrees Minutes Seconds:** 40° 1' 9.2807" N, 77° 42' 8.2676" W

**SEARCH RESULT SUMMARY**

| Conservation Planning Category | Detected Area Summary |
|---|---|
| Natural Heritage Areas | 4 sites |
| Protected Lands | 7 tracts; 1,360.93 acres |
| Important Bird Areas | 1 area |

**Natural Heritage Areas**

Natural Heritage Areas (NHAs) are sites that have been identified as critical habitat for species or natural communities of concern. This dataset is designed to identify, map and discuss areas that support species of concern, exemplary natural communities, and broad expanses of intact natural ecosystems that support components of Pennsylvanias native species biodiversity. These areas are prioritized based upon their ecological qualities and provided with recommendations regarding their management and protection. Most of the existing NHAs have been developed through PNHPs County Natural Heritage Inventories -- systematic studies of the critical biological resources of a county.

| Natural Heritage Site Name | Description | Reference |
|---|---|---|
| Clarks Knob | Area contains a population of a species of concern. | Link |
| Dunn's Creek Meadow | Site supports an animal species of concern. | Link |
| Keasey Run Wetlands | A plant species of concern occurs in marshy bottomland along a creek. | Link |
| Letterkenny Army Depot | Site contains an Ephemeral Fluctuating Pool Natural Community. Area also contains good grassland bird habitat. | Link |

**State Lands**

These include lands managed by the Department of Natural Resources (DCNR) Bureau of Forestry (BOF) for long-term forest health and native plant conservation; Pennsylvania Game Commission (PGC) for hunting, trapping and fishing; and DCNR Bureau of State Parks (BSP) for healthful outdoor recreation and environmental education.

| Name | Wild Area Type | Wild Area Name | Manager | Total Acres |
|---|---|---|---|---|
| Buchanan State Forest | None | NA | BOF | 5394.88 |
| State Gameland 235 | None | NA | PGC | 211.81 |
| State Gameland 76 | None | NA | PGC | 4298.03 |

**Protected Lands**

Protected lands or conservation areas are locations which receive protection, through legal or other means, because of their recognized natural, ecological and/or cultural values.

| Name | Description | Owner | Website | Total Acres |
|---|---|---|---|---|
| Franklin County Agricultural Easement #100 | LOC | Franklin County | Link | 368.00 |
| Franklin County Agricultural Easement #101 | LOC | Franklin County | Link | 170.00 |
| 9/11 Memorial | Local Park | Greene Township | | 0.00 |
| National Trust for Historic Preservation CE | Nonprofit | National Trust for Historic Preservation | Link | 158.00 |

**Important Bird Areas (IBAs)**

These are areas recognized as being globally important habitat for the conservation of bird populations. Currently there are about 10,000 IBAs worldwide. The program was developed and sites are identified by BirdLife International.

| IBA Site Number | Name | Reference |
|---|---|---|
| 1157 | Kittatinny Ridge | Link |

For additional information about the Pennsylvania Natural Heritage Program, visit the website at www.naturalheritage.state.pa.us or you can email your questions and comments to RA-HeritageReview@pa.gov.

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**PNDI #** N/A **USFWS Project #** 2025-0051386

# U.S. FISH AND WILDLIFE SERVICE

**110 Radnor Road, Suite 101, State College, PA 16801**

This responds to your inquiry about a PNDI Internet Database search that resulted in a potential conflict with a federally listed, proposed or candidate species.

**PROJECT LOCATION INFORMATION**

County: Franklin

Township:

USFWS COMMENTS ☑ EMAILED ☐ MAILED

To: Lauren Joyal

**MISC INFORMATION**

Date received by FWS: 4/8/2025

Email: Lauren.E.Joyal@usace.army.mil

Affiliation: U.S. Army Corps of Engineers

**SPECIFIC PROJECT**: PrSMMF & Voelz Gate Letterkenny Army Depot

**FISH AND WILDLIFE SERVICE COMMENT(s):**

☐ ***NO EFFECT***

Except for occasional transient species, no federally listed, proposed or candidate species under our jurisdiction are known or likely to exist in the project area. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

☑ ***NOT LIKELY TO ADVERSELY AFFECT***

The federally listed Indian bat, northern long-eared bat, tricolored bat occurs or may occur in or near the project area. However, based on our review of the information provided, including the project description and location (minimal tree removal (<1 acre) will be done when bats are unlikely to be present in the project area (Oct 1 - March 31)), no adverse effects to this species are likely to occur. If there is any change in the location, scale, scope, layout or design of the project, further consultation or coordination with the Service will be necessary.

The above determination is valid for two years from the date of this letter. In addition, this response relates only to federally listed, proposed, and candidate species under our jurisdiction, based on an office review of the proposed project's location and anticipated impacts. No field inspection of the project area has been conducted by this office. *Please reference the above PNDI # and USFWS Project # in any future correspondence regarding this project.*

This review was conducted by the biologist listed below. He/she can be contacted at 814-206-(Extension).

☐ Pamela Shellenberger (x7459)
☐ Monica Mestre (x7462)
☐ Emily Ernst (x7453)
☑ Nicole Ranalli (x7455)
☐ Jennifer Kagel (x7451)
☐ Richard Novak (x7477)
☐ Sze Wing Yu (x7461)

SIGNATURE:

Supervisor, Pennsylvania Field Office

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**From:** Ranalli, Nicole A
**To:** Joyal, Lauren E CIV USARMY CENAB (USA)
**Subject:** [Non-DoD Source] Re: [EXTERNAL] RE: 2025-0051386 MMF & Voelz Gate Letterkenny Army Depot
**Date:** Friday, August 1, 2025 3:06:19 PM
**Attachments:** image001.png
Outlook-A graphic .png

---

Hi Lauren,
I don't know why you ended up with MA for NLEB. However, since you will be removing trees between Oct 1 and March 31, your previous determination of NLAA still stands.

Thank you,
Nicole

Nicole Ranalli (she/her)
Endangered Species Biologist
U.S. Fish & Wildlife Service
Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
814 206-7455
nicole_ranalli@fws.gov

FWS VALUES
STEWARDSHIP – INTEGRITY – RESPECT – COLLABORATION – INNOVATION

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**From:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Sent:** Friday, August 1, 2025 2:54 PM
**To:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Subject:** RE: [EXTERNAL] RE: 2025-0051386 MMF & Voelz Gate Letterkenny Army Depot

Thanks for the quick response. No, the project does not involve burns, but Letterkenny does do prescribe burns frequently on the Installation. I updated the NLEB/Tricolored D-Key and attached it here, this does not include fires. I also attached the NE species D-Key with the NE bulrush “no effect”.

-Lauren

---

**From:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Sent:** Friday, August 1, 2025 1:34 PM
**To:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Subject:** [Non-DoD Source] Re: [EXTERNAL] RE: 2025-0051386 MMF & Voelz Gate Letterkenny Army Depot

Hi Lauren,
Does this project involve Rx fire? If not, you may want to update the Dkey - that may be the

reason you got MA for tricolored bats.

In addition, we now have a Dkey for all the rest of the species in PA - called the northeast dkey. If you'd like assisted determination for Ibat, and northeastern bulrush - you could use that key to get a determination. And I do think you should get NE or NLAA for those species.

As far as monarch, yes, I agree that your determination of "no jeopardy" is still valid.

Let me know if you run into any issues with the NE dkey. BTW - you can always update your project area and re-run a species list in existing projects, so you do not need to create a new one, it should save you a little time!

Have a good weekend,
Nicole

Nicole Ranalli (she/her)
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State College, PA 16801
814 206-7455
nicole_ranalli@fws.gov

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**From:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Sent:** Friday, August 1, 2025 8:57 AM
**To:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Subject:** FW: [EXTERNAL] RE: 2025-0051386 MMF & Voelz Gate Letterkenny Army Depot

---

**From:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Sent:** Friday, August 1, 2025 8:56 AM
**To:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Subject:** RE: [EXTERNAL] RE: 2025-0051386 MMF & Voelz Gate Letterkenny Army Depot

Hello,

I would like to update this project. There has been a slight extension of the Voelz Gate LOD, which extends from the original site all the way east to Pennsylvania Ave. This is for a proposed utility pipe, and it would be placed underneath the existing road. I have

attached a map to confirm this and a map to show the previous LOD. I created a new project in IPaC to update the LOD. I attached the official species list from this as well as the D-Key results. All the D-Key answers were the same as the project when original consultation took place. Do you concur that the utility addition does not impact the original results of consultation of NLAA for northeastern bulrush, monarch, NLEBs and tricolored bats so long as tree removal is avoided Oct 1 – Mar 31?

Thanks,
Lauren

---

**From:** Joyal, Lauren E CIV USARMY CENAB (USA)
**Sent:** Tuesday, April 8, 2025 11:45 AM
**To:** 'Ranalli, Nicole A' <nicole_ranalli@fws.gov>
**Subject:** RE: [EXTERNAL] RE: 2025-0051386 PrSMMF & Voelz Gate Letterkenny Army Depot

Thanks for the input, I will keep a lookout for the other bat form.

---

**From:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Sent:** Tuesday, April 8, 2025 11:41 AM
**To:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Subject:** [Non-DoD Source] Re: [EXTERNAL] RE: 2025-0051386 PrSMMF & Voelz Gate Letterkenny Army Depot

Lauren,
I am filling out a form to cover the 3 bat species. I concur that your project is unlikely to effect northeastern bulrush, and effects to monarch are indiscriminate, so we concur that the project is not likely to result in jeopardy.

Thank you,
Nicole

Nicole Ranalli (she/her)
Endangered Species Biologist
U.S. Fish & Wildlife Service
Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
814 206-7455
nicole_ranalli@fws.gov

FWS VALUES
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**From:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Sent:** Tuesday, April 8, 2025 10:46 AM
**To:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Subject:** RE: [EXTERNAL] RE: 2025-0051386 PrSMMF & Voelz Gate Letterkenny Army Depot

Yes, we would be able to follow time of year restrictions.

---

**From:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Sent:** Tuesday, April 8, 2025 10:21 AM
**To:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Subject:** [Non-DoD Source] Re: [EXTERNAL] RE: 2025-0051386 PrSMMF & Voelz Gate Letterkenny Army Depot

Thank you so much for the additional information. Would you be able to remove the trees when northern long-eared bats are unlikely to be present (Oct 1 - March 31)?

Best,
Nicole

Nicole Ranalli (she/her)
Endangered Species Biologist
U.S. Fish & Wildlife Service
Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
814 206-7455
nicole_ranalli@fws.gov

FWS VALUES
STEWARDSHIP – INTEGRITY – RESPECT – COLLABORATION – INNOVATION

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**From:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Sent:** Tuesday, April 8, 2025 9:28 AM
**To:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Subject:** [EXTERNAL] RE: 2025-0051386 PrSMMF & Voelz Gate Letterkenny Army Depot



Hello, thanks for the response. There would approximately 1 acre of tree removal. Also, the LODs have been tightened to further avoid wetlands. See attached maps.

Thanks!

---

**From:** Ranalli, Nicole A <nicole_ranalli@fws.gov>
**Sent:** Thursday, April 3, 2025 10:25 AM
**To:** Joyal, Lauren E CIV USARMY CENAB (USA) <Lauren.E.Joyal@usace.army.mil>
**Subject:** [Non-DoD Source] 2025-0051386 PrSMMF & Voelz Gate Letterkenny Army Depot

Lauren,

Can you let me know how much tree removal is associated with the project?

Thank you for your time,

Nicole Ranalli (she/her)
Endangered Species Biologist
U.S. Fish & Wildlife Service
Pennsylvania Field Office
110 Radnor Rd; Suite 101
State College, PA 16801
814 206-7455
nicole_ranalli@fws.gov

FWS VALUES
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# Appendix C
# Record of Non-Applicability

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# MISSLE MAINTENANCE FACILITY AND VOELZ GATE ACCESS CONTROL POINT
# RECORD OF NON-APPLICABILITY (RONA)

**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:** HARRISBURG IAP
**State:** Pennsylvania
**County(s):** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**b. Action Title:** Clean Air Act Emissions Calculations and Record of Non-Applicability for the Missile Maintenance Facility & Voelz Gate Access Control Point

**c. Project Number/s (if applicable):** R2025008

**d. Projected Action Start Date:** 9 / 2026

**e. Action Description:**

Letterkenny Army Depot (LEAD) is located in Chambersburg, central Franklin County, Pennsylvania and contains Letterkenny Munitions Center (LEMC) within its boundaries. LEMC is a United States (U.S.) Army, government-owned facility under the command of the Joint Munitions Command (JMC). LEMC conducts regional and global contingency distribution of munitions, provides missile maintenance, and conducts demilitarization of munitions for the Army in support of all Department of Defense (DoD) and international partners to provide readiness to the warfighter. The Proposed Action consists of the new construction of the MMF and Voelz Gate ACP.

The total construction for the MMF is an estimated 32 acres of disturbance on the northeastern edge of LEMC. The proposed site location for the MMF is owned by LEMC; however, it is leased for private agricultural use. The proposed MMF construction includes perimeter fencing, roadways for inbound and outbound commercial vehicles, personnel parking, and four individual buildings, described below. Additionally, the MMF requires QD Arcs that do not encompass existing habitable structures.
Maintenance building, total estimated footprint is approximately 46,000 square feet (SF).

Additional facilities included within the maintenance building include administrative, parts and equipment storage, and staff spaces (breakrooms, lockers, conference rooms).

Inert storage building, total estimated footprint is 10,000 SF.

Outdoor covered testing pad, total estimated footprint is 5,000 SF.

The proposed MMF includes stormwater management ponds along with extensive grading necessary for building construction, and a parking area for government and commercial vehicles. Designs for the MMF will follow the standard design criteria for Rocket and Missile Maintenance Building (as of 2024 no standard design under UFC exists for this specific category code) and explosive safety criteria per Defense Explosives Safety Regulation (DESR) 6055.9 (02.2024) will be followed.

# MISSLE MAINTENANCE FACILITY AND VOELZ GATE ACCESS CONTROL POINT
# RECORD OF NON-APPLICABILITY (RONA)

The total construction for the Voelz Gate ACP is an estimated 18 acres of disturbance. The proposed location, on the northwestern portion of LEMC, will encompass the existing ACP footprint and LEMC land that is currently leased for private agricultural use. The total proposed construction includes one outbound and two inbound vehicle lanes, queuing space for an estimated 26 commercial vehicles, 100 parking spaces for empty outbound vehicles, up to three individual buildings, and three truck inspection canopies. These are all described in detail below. Additionally, the proposed ACP must follow QD Arcs requirements and cannot be built within an existing QD Arc. The design would comply with UFC 4-022-01 Security Engineering: Entry Control Facilities / Access Control Points and applicable laws and executive orders.

Gatehouse building, total estimated footprint is 700 SF. Building design includes operational spaces and storage.

Search building, total estimated footprint is 1,000 SF. Would include staff facilities (breakroom, offices, and storage). This building could be combined into one facility with the Gatehouse building described above,

Overwatch, total estimated footprint is 40 SF.

Truck inspection canopy, three separate canopies, each estimated at 2,240 SF, totaling 6,720 SF.

The proposed Voelz Gate will replace the existing ACP. This will require demolition of the existing ACP once construction is complete. The proposed 100 parking spaces for empty outbound vehicles will be constructed on top of the former ACP footprint.

Under the No Action Alternative, no new facilities or supporting infrastructure to support DoD's PrSM program would be built at LEMC, and the site would remain leased agricultural land. LEMC would be incapable of serving as the CITE for maintenance of the PrSM program, impacting DoD's PrSM mission goals. Furthermore, if the MMF was not constructed, there would not be a missile maintenance facility in place to support PrSM sustainment requirements. LEMC would not be able to provide missile maintenance operations for the PrSM in a safe and effective manner and the ability for LEMC to support future missile systems would be jeopardized.

Under the No Action Alternative, no construction to improve the Voelz Gate would occur. The current ACP would continue to be utilized, although it does meet commercial vehicle ACP DoD standards and approximately 18 acres would remain in agricultural lease. Incoming commercial vehicles would continue to use a facility that does not meet the requirements for a Commercial Vehicle ACP and LEMC would be out of compliance with DoD's ACP performance standards for controlling access to the installation.

This report provides analysis of the Proposed Action which includes new construction and operation of 1) Missile Maintenance Facility (MMF) and 2) Voelz Gate Access Control Point (ACP). In addition, the Proposed Action also includes the demolition of the existing Voelz Gate ACP once the new ACP is operational.

**2. Analysis:** Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report included in Attachment 1.

# MISSLE MAINTENANCE FACILITY AND VOELZ GATE ACCESS CONTROL POINT RECORD OF NON-APPLICABILITY (RONA)

____ applicable
_X_ not applicable

**Conformity Analysis Summary:**

**2026**

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| NOT IN A REGULATORY AREA | | | |
| **VOC** | 0.319 | | |
| **NOx** | 2.877 | | |
| **CO** | 3.053 | | |
| **SOx** | 0.007 | | |
| **PM 10** | 78.984 | | |
| **PM 2.5** | 0.108 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.003 | | |
| Franklin Co, PA | | | |
| **VOC** | 0.319 | 50 | No |
| **NOx** | 2.877 | 100 | No |
| **CO** | 3.053 | | |
| **SOx** | 0.007 | | |
| **PM 10** | 78.984 | | |
| **PM 2.5** | 0.108 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.003 | | |

**2027**

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| NOT IN A REGULATORY AREA | | | |
| **VOC** | 0.506 | | |
| **NOx** | 4.472 | | |
| **CO** | 5.487 | | |
| **SOx** | 0.011 | | |
| **PM 10** | 83.373 | | |
| **PM 2.5** | 0.159 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.006 | | |
| Franklin Co, PA | | | |
| **VOC** | 0.506 | 50 | No |
| **NOx** | 4.472 | 100 | No |
| **CO** | 5.487 | | |
| **SOx** | 0.011 | | |
| **PM 10** | 83.373 | | |
| **PM 2.5** | 0.159 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.006 | | |

# MISSLE MAINTENANCE FACILITY AND VOELZ GATE ACCESS CONTROL POINT
# RECORD OF NON-APPLICABILITY (RONA)

## 2028

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| NOT IN A REGULATORY AREA | | | |
| **VOC** | 0.405 | | |
| **NOx** | 2.388 | | |
| **CO** | 3.543 | | |
| **SOx** | 0.009 | | |
| **PM 10** | 0.088 | | |
| **PM 2.5** | 0.079 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.004 | | |
| Franklin Co, PA | | | |
| **VOC** | 0.405 | 50 | No |
| **NOx** | 2.388 | 100 | No |
| **CO** | 3.543 | | |
| **SOx** | 0.009 | | |
| **PM 10** | 0.088 | | |
| **PM 2.5** | 0.079 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.004 | | |

## 2029 - (Steady State)

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| NOT IN A REGULATORY AREA | | | |
| **VOC** | 0.011 | | |
| **NOx** | 0.047 | | |
| **CO** | 0.031 | | |
| **SOx** | 0.010 | | |
| **PM 10** | 0.010 | | |
| **PM 2.5** | 0.010 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.000 | | |
| Franklin Co, PA | | | |
| **VOC** | 0.011 | 50 | No |
| **NOx** | 0.047 | 100 | No |
| **CO** | 0.031 | | |
| **SOx** | 0.010 | | |
| **PM 10** | 0.010 | | |
| **PM 2.5** | 0.010 | | |
| **Pb** | 0.000 | | |
| **NH3** | 0.000 | | |

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

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR

de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

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

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**Name, Title** **Date**

**Attachments**

Attachment 1 – Detail ACAM Report

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

## 1. General Information

**- Action Location**

**Base:** HARRISBURG IAP
**State:** Pennsylvania
**County(s):** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Action Title:** Clean Air Act Emissions Calculations and Record of Non-Applicability for the Missile Maintenance Facility & Voelz Gate Access Control Point

**- Project Number/s (if applicable):** R2025008

**- Projected Action Start Date:** 9 / 2026

**- Action Purpose and Need:**

The purpose of the Proposed Action is to provide an effective and efficient maintenance facility (MF) that is compliant with Ammunition and Explosives Safety Standards as well as an ACP that is compliant with Entry Control Facility Standard for ACPs. Both facilities would be capable of supporting the DoD's new Precision Strike Missile (PrSM) mission proposed at LEMC. LEMC is operated by JMC as a tier one Army Strategic Mobility Platform that provides munitions support for all DoD organizations and is a Center of Industrial and Technical Excellence (CITE) for surveillance, receipt, storage, issue, testing and repair for multiple precision fire systems.

Construction of a new MMF is needed as there are no facilities with the capacity or proper configuration to meet the PrSM system maintenance requirements on-site at LEMC. Proper configuration includes the Explosive Safety Quantity-Distance Arcs (QD Arcs) required by the MMF. QD Arcs are safety buffers intended to protect explosive mission functions from encroaching development while also protecting life and property from explosive hazards. New habitable structures cannot exist within existing QD Arcs and new facilities with explosive hazards cannot be located such that its QD Arcs encompass existing habitable structures. Due to the nature of facilities at LEMC, many existing buildings have QD Arcs encompassing areas around them, limiting development on previously developed areas at LEMC. Proposed components of the MMF include a maintenance building, storage building, outdoor covered test pad, as well as a covered forklift charging pad and a water storage tank to meet fire suppression requirements and will have an estimated limit of disturbance (LOD) of 32 acres.

Additionally, the current ACP, Voelz Gate, which is used for commercial vehicle deliveries at LEMC, is undersized and does not meet current DoD standards. In its current state, the Voelz Gate, lacks sufficient space for commercial vehicles to queue prior to inspection before entering the installation (Unified Facilities Criteria (UFC) standards for entry control ACPs). Therefore, demolition of the existing ACP and construction of an updated and DoD-compliant ACP is needed.

If this project is not provided, LEMC will be unable to meet Army and DoD mission standards or requirements for 1) Ammunition and explosives safety standards compliance for maintenance facilities or 2) Entry control standards for ACPs.

**- Action Description:**

Letterkenny Army Depot (LEAD) is located in Chambersburg, central Franklin County, Pennsylvania and contains Letterkenny Munitions Center (LEMC) within its boundaries. LEMC is a United States (U.S.) Army, government-owned facility under the command of the Joint Munitions Command (JMC). LEMC conducts regional and global contingency distribution of munitions, provides missile maintenance, and conducts demilitarization of munitions for the Army in support of all Department of Defense (DoD) and international

partners to provide readiness to the warfighter. The Proposed Action consists of the new construction of the MMF and Voelz Gate ACP.

The total construction for the MMF is an estimated 32 acres of disturbance on the northeastern edge of LEMC. The proposed site location for the MMF is owned by LEMC; however, it is leased for private agricultural use. The proposed MMF construction includes perimeter fencing, roadways for inbound and outbound commercial vehicles, personnel parking, and four individual buildings, described below. Additionally, the MMF requires QD Arcs that do not encompass existing habitable structures.

Maintenance building, total estimated footprint is approximately 46,000 square feet (SF).

Additional facilities included within the maintenance building include administrative, parts and equipment storage, and staff spaces (breakrooms, lockers, conference rooms).

Inert storage building, total estimated footprint is over 1,000 SF.

Outdoor covered testing pad, total estimated footprint is over 1,000 F.

The proposed MMF includes stormwater management ponds along with extensive grading necessary for building construction, and a parking area for government and commercial vehicles. Designs for the MMF will follow the standard design criteria for Rocket and Missile Maintenance Building (as of 2024 no standard design under UFC exists for this specific category code) and explosive safety criteria per Defense Explosives Safety Regulation (DESR) 6055.9 (02.2024) will be followed.

The total construction for the Voelz Gate ACP is an estimated 18 acres of disturbance. The proposed location, on the northwestern portion of LEMC, will encompass the existing ACP footprint and LEMC land that is currently leased for private agricultural use. The total proposed construction includes one outbound and two inbound vehicle lanes, queuing space for an estimated 26 commercial vehicles, 100 parking spaces for empty outbound vehicles, up to three individual buildings, and three truck inspection canopies. These are all described in detail below. Additionally, the proposed ACP must follow QD Arcs requirements and cannot be built within an existing QD Arc. The design would comply with UFC 4-022-01 Security Engineering: Entry Control Facilities / Access Control Points and applicable laws and executive orders.

Gatehouse building building design includes operational spaces and storage.

The Search building would include staff facilities (breakroom, offices, and storage). This building could be combined into one facility with the Gatehouse building described above,

Truck inspection canopy, three separate canopies, each estimated at over 1,000 SF

The proposed Voelz Gate will replace the existing ACP. This will require demolition of the existing ACP once construction is complete. The proposed 100 parking spaces for empty outbound vehicles will be constructed on top of the former ACP footprint.

Under the No Action Alternative, no new facilities or supporting infrastructure to support DoD's PrSM program would be built at LEMC, and the site would remain leased agricultural land. LEMC would be incapable of serving as the CITE for maintenance of the PrSM program, impacting DoD's PrSM mission goals. Furthermore, if the MMF was not constructed, there would not be a missile maintenance facility in place to support PrSM sustainment requirements. LEMC would not be able to provide missile maintenance operations for the PrSM in a safe and effective manner and the ability for LEMC to support future missile systems would be jeopardized.

Under the No Action Alternative, no construction to improve the Voelz Gate would occur. The current ACP would continue to be utilized, although it does meet commercial vehicle ACP DoD standards and approximately 18 acres would remain in agricultural lease. Incoming commercial vehicles would continue to use a facility that does not meet the requirements for a Commercial Vehicle ACP and LEMC would be out of compliance with DoD's ACP performance standards for controlling access to the installation.

This report provides analysis of the Proposed Action which includes new construction and operation of 1) Missile Maintenance Facility (MMF) and 2) Voelz Gate Access Control Point (ACP). In addition, the Proposed Action also includes the demolition of the existing Voelz Gate ACP once the new ACP is operational.

**- Activity List:**

| Activity Type | | Activity Title |
|---|---|---|
| 2. | Construction / Demolition | PrSM Maintenance Facility - Maintenance Building |
| 3. | Construction / Demolition | PrSM Maintenance Facility - Grading of up to 32 acre site |
| 4. | Construction / Demolition | PrSM Maintenance Facility - Inert Storage Building |
| 5. | Construction / Demolition | PrSM Maintenance Facility - Covered Open Testing Pad |
| 6. | Construction / Demolition | PrSM Maintenance Facility - Building Coating |
| 7. | Construction / Demolition | PrSM Maintenance Facility - External Facility Components |
| 8. | Construction / Demolition | Voelz Gate - Demolition and Construction of 3 Buildings |
| 9. | Construction / Demolition | Voelz Gate - Truck Inspection Canopies (3 Separate Canopies) |
| 10. | Emergency Generator | Voelz Gate - Emergency Generator |

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

## 2. Construction / Demolition

### 2.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** PrSM Maintenance Facility - Maintenance Building

**- Activity Description:**
General Description: The maintenance building is the primary and largest building at the Facility and is utilized for most of the missile maintenance activities. The building is to be designed with an open concept where the maintenance activities occur in a large open area.

The Facility will include four individual buildings:
- Maintenance building: This project element is analyzed in this specific ACAM component.

These other projects, while part of the proposed action, are each analyzed in their own specific ACAM component.
- Inert storage building
- Outdoor covered testing pad
  -Building Coating

The maintenance building will be designed to accommodate two individual missile maintenance operations.
• The maintenance building will be designed as an open-bay concept with minimal walls/barriers between each operation and between workstations and have high-bay ceilings for equipment allowances.

• In addition to housing the missile maintenance operations, the maintenance building will contain the following components:
- Maintenance area - two maintenance operations with highbay ceilings
- Administrative - 1,800 SF
- Parts storage - 1,000 SF
- Handling equipment storage - 1,000 SF
- Break room - 500 SF for 20 people
- Conference/training room - 500 SF for 20 people
- Locker/personal item storage area - 200 SF
- Paint booth - 600 SF
- Clean room - 600 SF

• Each operation will feature a five-ton overhead crane system with 20 foot hook height that can accommodate four hoists each with the ability to add more as necessary.
• The vehicle access drive shall encircle the building to allow for increased access to the loading/unloading areas and maneuverability of tractor trailers.

**- Activity Start Date**
**Start Month:** 6
**Start Month:** 2027

**- Activity End Date**
**Indefinite:** False
**End Month:** 9
**End Month:** 2028

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.196339 |
| $SO_x$ | 0.003939 |
| $NO_x$ | 1.617950 |
| CO | 2.183231 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 0.051220 |
| PM 2.5 | 0.047110 |
| Pb | 0.000000 |
| $NH_3$ | 0.002671 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.015682 |
| $N_2O$ | 0.003282 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 401.102818 |
| $CO_2e$ | 402.472552 |

**- Global Scale Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.015682 |
| $N_2O$ | 0.003282 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 401.102818 |
| $CO_2e$ | 402.472552 |

## 2.1 Building Construction Phase

### 2.1.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 6
**Start Quarter:** 1
**Start Year:** 2027

**- Phase Duration**
**Number of Month:** 16
**Number of Days:** 0

### 2.1.2 Building Construction Phase Assumptions

**- General Building Construction Information**

**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 46000
**Height of Building (ft):** 32
**Number of Units:** N/A

**- Building Construction Default Settings**

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

**- Construction Exhaust (default)**

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

**- Vehicle Exhaust**

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

**- Vehicle Exhaust Vehicle Mixture (%)**

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

**- Worker Trips**

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

**- Worker Trips Vehicle Mixture (%)**

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

**- Vendor Trips**

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

**- Vendor Trips Vehicle Mixture (%)**

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

### 2.1.3 Building Construction Phase Emission Factor(s)

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.19464 | 0.00487 | 1.74774 | 1.62852 | 0.07179 | 0.06605 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.22849 | 0.00487 | 2.15229 | 3.56761 | 0.09240 | 0.08501 |
| **Generator Sets Composite [HP: 14] [LF: 0.74]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.53730 | 0.00793 | 4.30480 | 2.85227 | 0.17170 | 0.15796 |

| Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37] | | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.17717 | 0.00489 | 1.80740 | 3.48712 | 0.05440 | 0.05005 |
| **Welders Composite [HP: 46] [LF: 0.45]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.43501 | 0.00735 | 3.46616 | 4.46084 | 0.07894 | 0.07263 |

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

| Cranes Composite [HP: 367] [LF: 0.29] | | | | |
|---|---|---|---|---|
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02140 | 0.00428 | 527.45492 | 529.26501 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02138 | 0.00428 | 527.06992 | 528.87869 |
| **Generator Sets Composite [HP: 14] [LF: 0.74]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02305 | 0.00461 | 568.30624 | 570.25652 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02148 | 0.00430 | 529.61807 | 531.43559 |
| **Welders Composite [HP: 46] [LF: 0.45]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02305 | 0.00461 | 568.29664 | 570.24689 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.16405 | 0.00191 | 0.08017 | 2.63443 | 0.00450 | 0.00398 | 0.02318 |
| LDGT | 0.17045 | 0.00251 | 0.12705 | 2.90633 | 0.00619 | 0.00548 | 0.02489 |
| HDGV | 0.70192 | 0.00606 | 0.66705 | 11.59795 | 0.02334 | 0.02064 | 0.05074 |
| LDDV | 0.06754 | 0.00094 | 0.05768 | 2.38558 | 0.00240 | 0.00221 | 0.00820 |
| LDDT | 0.06604 | 0.00115 | 0.08885 | 1.88730 | 0.00314 | 0.00289 | 0.00857 |
| HDDV | 0.09275 | 0.00401 | 2.13027 | 1.42148 | 0.02859 | 0.02631 | 0.03212 |
| MC | 2.32377 | 0.00259 | 0.68502 | 12.40614 | 0.02346 | 0.02075 | 0.05483 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01170 | 0.00436 | 287.75348 | 289.34420 |
| LDGT | 0.01282 | 0.00625 | 377.15067 | 379.33207 |
| HDGV | 0.05692 | 0.02577 | 911.61519 | 920.70670 |
| LDDV | 0.04018 | 0.00068 | 281.68792 | 282.89262 |
| LDDT | 0.03523 | 0.00098 | 344.55815 | 345.73085 |
| HDDV | 0.02947 | 0.00308 | 1196.71174 | 1198.36499 |
| MC | 0.10794 | 0.00292 | 390.43717 | 394.00689 |

### 2.1.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

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

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

LF: Equipment Load Factor
$EF_{POL}$: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

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

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

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

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

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

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

## 3. Construction / Demolition

### 3.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** PrSM Maintenance Facility - Grading of up to 32 acre site

**- Activity Description:**
The total construction for the MMF is an estimated 32 acres of disturbance on the northeastern edge of LEMC.

Cut 215,219 cubic yards and fill 109,890 cubic yards.

Cut-Fill (to be trucked off-site) = 105,319 cubic yards

Assumed a LOD of 32 acres based on above estimation.

**- Activity Start Date**
**Start Month:** 9
**Start Month:** 2026

**- Activity End Date**
**Indefinite:** False
**End Month:** 6
**End Month:** 2027

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.447408 |
| $SO_x$ | 0.009571 |
| $NO_x$ | 4.097024 |
| CO | 4.255655 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 138.830410 |
| PM 2.5 | 0.150634 |
| Pb | 0.000000 |
| $NH_3$ | 0.005194 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.043620 |
| $N_2O$ | 0.008561 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 1133.670427 |
| $CO_2e$ | 1137.311889 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.043620 |
| $N_2O$ | 0.008561 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 1133.670427 |
| $CO_2e$ | 1137.311889 |

### 3.1 Site Grading Phase

### 3.1.1 Site Grading Phase Timeline Assumptions

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

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

### 3.1.2 Site Grading Phase Assumptions

**- General Site Grading Information**
**Area of Site to be Graded ($ft^2$):** 1393920
**Amount of Material to be Hauled On-Site ($yd^3$):** 0
**Amount of Material to be Hauled Off-Site ($yd^3$):** 105319

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

**- Construction Exhaust (default)**

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

**- Vehicle Exhaust**
**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

### 3.1.3 Site Grading Phase Emission Factor(s)

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

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.39317 | 0.00542 | 3.40690 | 4.22083 | 0.09860 | 0.09071 |
| **Graders Composite [HP: 148] [LF: 0.41]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.31292 | 0.00490 | 2.52757 | 3.39734 | 0.14041 | 0.12918 |
| **Other Construction Equipment Composite [HP: 82] [LF: 0.42]** | | | | | | |

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
|---|---|---|---|---|---|---|
| Emission Factors | 0.28160 | 0.00487 | 2.73375 | 3.50416 | 0.15811 | 0.14546 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.35280 | 0.00491 | 3.22260 | 2.72624 | 0.14205 | 0.13069 |
| **Scrapers Composite [HP: 423] [LF: 0.48]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19606 | 0.00488 | 1.74061 | 1.53912 | 0.06788 | 0.06245 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.18406 | 0.00489 | 1.88476 | 3.48102 | 0.06347 | 0.05839 |

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

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02381 | 0.00476 | 587.02896 | 589.04350 |
| **Graders Composite [HP: 148] [LF: 0.41]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02153 | 0.00431 | 530.81500 | 532.63663 |
| **Other Construction Equipment Composite [HP: 82] [LF: 0.42]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.54121 | 529.35159 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02160 | 0.00432 | 532.54993 | 534.37751 |
| **Scrapers Composite [HP: 423] [LF: 0.48]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02145 | 0.00429 | 528.85412 | 530.66901 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.70686 | 531.52468 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.17041 | 0.00196 | 0.08731 | 2.77727 | 0.00459 | 0.00406 | 0.02337 |
| LDGT | 0.17953 | 0.00255 | 0.14323 | 3.04901 | 0.00627 | 0.00554 | 0.02509 |
| HDGV | 0.73514 | 0.00605 | 0.74827 | 12.39641 | 0.02441 | 0.02159 | 0.05103 |
| LDDV | 0.07335 | 0.00098 | 0.06912 | 2.70575 | 0.00251 | 0.00231 | 0.00820 |
| LDDT | 0.07182 | 0.00117 | 0.09975 | 1.94406 | 0.00315 | 0.00290 | 0.00857 |
| HDDV | 0.10225 | 0.00411 | 2.25690 | 1.46515 | 0.03428 | 0.03154 | 0.03227 |
| MC | 2.33129 | 0.00259 | 0.68674 | 12.53711 | 0.02345 | 0.02075 | 0.05451 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01235 | 0.00445 | 294.53825 | 296.17024 |
| LDGT | 0.01381 | 0.00649 | 383.94708 | 386.22265 |
| HDGV | 0.06125 | 0.02727 | 910.04397 | 919.69038 |
| LDDV | 0.04273 | 0.00068 | 292.66003 | 293.92840 |
| LDDT | 0.03571 | 0.00098 | 348.79466 | 349.97947 |
| HDDV | 0.02975 | 0.00307 | 1226.44620 | 1228.10448 |
| MC | 0.10932 | 0.00292 | 390.34183 | 393.94585 |

### 3.1.4 Site Grading Phase Formula(s)

**- Fugitive Dust Emissions per Phase**
$PM10_{FD} = (20 * ACRE * WD) / 2000$

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

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
$HA_{OnSite}$: Amount of Material to be Hauled On-Site ($yd^3$)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site ($yd^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

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

## 4. Construction / Demolition

### 4.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** PrSM Maintenance Facility - Inert Storage Building

**- Activity Description:**
Inert Storage Building
• Size –10,000 SF
• Design/components –Storage/warehouse
• Utilities –Sewer not needed, water required for fire suppression
• Unloading/loading Areas –Two doors

**- Activity Start Date**
**Start Month:** 6
**Start Month:** 2027

**- Activity End Date**
**Indefinite:** False
**End Month:** 9
**End Month:** 2028

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.072330 |
| $SO_x$ | 0.001718 |
| $NO_x$ | 0.627618 |
| CO | 0.974348 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 0.024081 |
| PM 2.5 | 0.022148 |
| Pb | 0.000000 |
| $NH_3$ | 0.001004 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.007678 |
| $N_2O$ | 0.001638 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 191.669417 |
| $CO_2e$ | 192.349166 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.007678 |
| $N_2O$ | 0.001638 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 191.669417 |
| $CO_2e$ | 192.349166 |

### 4.1 Building Construction Phase

#### 4.1.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 6

**Start Quarter:** 1
**Start Year:** 2027

**- Phase Duration**
**Number of Month:** 16
**Number of Days:** 0

### 4.1.2 Building Construction Phase Assumptions

**- General Building Construction Information**
**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 5000
**Height of Building (ft):** 30
**Number of Units:** N/A

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

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cranes Composite | 1 | 4 |
| Forklifts Composite | 2 | 6 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

**- Vendor Trips**
**Average Vendor Round Trip Commute (mile):** 40 (default)

**- Vendor Trips Vehicle Mixture (%)**

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

### 4.1.3 Building Construction Phase Emission Factor(s)

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

| Cranes Composite [HP: 367] [LF: 0.29] | | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.19464 | 0.00487 | 1.74774 | 1.62852 | 0.07179 | 0.06605 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Emission Factors | 0.22849 | 0.00487 | 2.15229 | 3.56761 | 0.09240 | 0.08501 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.17717 | 0.00489 | 1.80740 | 3.48712 | 0.05440 | 0.05005 |

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.45492 | 529.26501 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02138 | 0.00428 | 527.06992 | 528.87869 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02148 | 0.00430 | 529.61807 | 531.43559 |

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

| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$NH_3$** |
|---|---|---|---|---|---|---|---|
| LDGV | 0.16405 | 0.00191 | 0.08017 | 2.63443 | 0.00450 | 0.00398 | 0.02318 |
| LDGT | 0.17045 | 0.00251 | 0.12705 | 2.90633 | 0.00619 | 0.00548 | 0.02489 |
| HDGV | 0.70192 | 0.00606 | 0.66705 | 11.59795 | 0.02334 | 0.02064 | 0.05074 |
| LDDV | 0.06754 | 0.00094 | 0.05768 | 2.38558 | 0.00240 | 0.00221 | 0.00820 |
| LDDT | 0.06604 | 0.00115 | 0.08885 | 1.88730 | 0.00314 | 0.00289 | 0.00857 |
| HDDV | 0.09275 | 0.00401 | 2.13027 | 1.42148 | 0.02859 | 0.02631 | 0.03212 |
| MC | 2.32377 | 0.00259 | 0.68502 | 12.40614 | 0.02346 | 0.02075 | 0.05483 |

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

| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
|---|---|---|---|---|
| LDGV | 0.01170 | 0.00436 | 287.75348 | 289.34420 |
| LDGT | 0.01282 | 0.00625 | 377.15067 | 379.33207 |
| HDGV | 0.05692 | 0.02577 | 911.61519 | 920.70670 |
| LDDV | 0.04018 | 0.00068 | 281.68792 | 282.89262 |
| LDDT | 0.03523 | 0.00098 | 344.55815 | 345.73085 |
| HDDV | 0.02947 | 0.00308 | 1196.71174 | 1198.36499 |
| MC | 0.10794 | 0.00292 | 390.43717 | 394.00689 |

### 4.1.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

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

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

**- Vehicle Exhaust Emissions per Phase**

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

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

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

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

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

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

## 5. Construction / Demolition

### 5.1 General Information & Timeline Assumptions

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** PrSM Maintenance Facility - Covered Open Testing Pad

**- Activity Description:**
Covered Testing Pad
• Size –5,000 SF
• Design/components –No walls
• Utilities –Sewer not needed; water required for fire suppression
• Unloading/loading Areas –Vehicle access to all sides

**- Activity Start Date**
**Start Month:** 7
**Start Month:** 2027

**- Activity End Date**
**Indefinite:** False
**End Month:** 9
**End Month:** 2027

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.017878 |
| $SO_x$ | 0.000307 |
| $NO_x$ | 0.136375 |
| CO | 0.207386 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 0.005527 |
| PM 2.5 | 0.005083 |
| Pb | 0.000000 |
| $NH_3$ | 0.000303 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.001240 |
| $N_2O$ | 0.000284 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 30.982944 |
| $CO_2e$ | 31.098489 |

**- Global Scale Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.001240 |
| $N_2O$ | 0.000284 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 30.982944 |
| $CO_2e$ | 31.098489 |

## 5.1 Paving Phase

### 5.1.1 Paving Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 7
**Start Quarter:** 1
**Start Year:** 2027

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

### 5.1.2 Paving Phase Assumptions

**- General Paving Information**

**Paving Area ($ft^2$):** 5000

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

**- Construction Exhaust (default)**

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

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

### 5.1.3 Paving Phase Emission Factor(s)

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

| **Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.55279 | 0.00855 | 4.19775 | 3.25549 | 0.16311 | 0.15007 |
| **Pavers Composite [HP: 81] [LF: 0.42]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.22921 | 0.00486 | 2.45013 | 3.43821 | 0.11941 | 0.10986 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.52865 | 0.00542 | 3.57666 | 4.10537 | 0.14602 | 0.13434 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.17717 | 0.00489 | 1.80740 | 3.48712 | 0.05440 | 0.05005 |

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

| **Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02313 | 0.00463 | 570.32048 | 572.27767 |
| **Pavers Composite [HP: 81] [LF: 0.42]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02133 | 0.00427 | 525.80912 | 527.61356 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02382 | 0.00476 | 587.12246 | 589.13732 |

| Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37] | | | | |
|---|---|---|---|---|
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02148 | 0.00430 | 529.61807 | 531.43559 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.16405 | 0.00191 | 0.08017 | 2.63443 | 0.00450 | 0.00398 | 0.02318 |
| LDGT | 0.17045 | 0.00251 | 0.12705 | 2.90633 | 0.00619 | 0.00548 | 0.02489 |
| HDGV | 0.70192 | 0.00606 | 0.66705 | 11.59795 | 0.02334 | 0.02064 | 0.05074 |
| LDDV | 0.06754 | 0.00094 | 0.05768 | 2.38558 | 0.00240 | 0.00221 | 0.00820 |
| LDDT | 0.06604 | 0.00115 | 0.08885 | 1.88730 | 0.00314 | 0.00289 | 0.00857 |
| HDDV | 0.09275 | 0.00401 | 2.13027 | 1.42148 | 0.02859 | 0.02631 | 0.03212 |
| MC | 2.32377 | 0.00259 | 0.68502 | 12.40614 | 0.02346 | 0.02075 | 0.05483 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01170 | 0.00436 | 287.75348 | 289.34420 |
| LDGT | 0.01282 | 0.00625 | 377.15067 | 379.33207 |
| HDGV | 0.05692 | 0.02577 | 911.61519 | 920.70670 |
| LDDV | 0.04018 | 0.00068 | 281.68792 | 282.89262 |
| LDDT | 0.03523 | 0.00098 | 344.55815 | 345.73085 |
| HDDV | 0.02947 | 0.00308 | 1196.71174 | 1198.36499 |
| MC | 0.10794 | 0.00292 | 390.43717 | 394.00689 |

### 5.1.4 Paving Phase Formula(s)

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

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area ($ft^2$)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

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

$VOC_P$: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area ($ft^2$)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)$^2$ / acre)

## 6. Construction / Demolition

### 6.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** PrSM Maintenance Facility - Building Coating

**- Activity Description:**
Building Coating
• Size –8,500 SF
• Design/components –Paint booth with storage area
• Utilities –Sewer not needed
• Unloading/loading Areas –One door

**- Activity Start Date**
**Start Month:** 6
**Start Month:** 2027

**- Activity End Date**

**Indefinite:** False
**End Month:** 9
**End Month:** 2028

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.171176 |
| $SO_x$ | 0.001727 |
| $NO_x$ | 0.631609 |
| CO | 0.978203 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 0.024136 |
| PM 2.5 | 0.022199 |
| Pb | 0.000000 |
| $NH_3$ | 0.001074 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.007738 |
| $N_2O$ | 0.001646 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 194.032578 |
| $CO_2e$ | 194.716221 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.007736 |
| $N_2O$ | 0.001645 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 193.983707 |
| $CO_2e$ | 194.667073 |

### 6.1 Building Construction Phase

#### 6.1.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 6
**Start Quarter:** 1
**Start Year:** 2027

**- Phase Duration**
**Number of Month:** 16
**Number of Days:** 0

#### 6.1.2 Building Construction Phase Assumptions

**- General Building Construction Information**
**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 8500
**Height of Building (ft):** 30
**Number of Units:** N/A

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

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cranes Composite | 1 | 4 |
| Forklifts Composite | 2 | 6 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**

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

**- Vehicle Exhaust Vehicle Mixture (%)**

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

**- Worker Trips**

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

**- Worker Trips Vehicle Mixture (%)**

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

**- Vendor Trips**

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

**- Vendor Trips Vehicle Mixture (%)**

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

### 6.1.3 Building Construction Phase Emission Factor(s)

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19464 | 0.00487 | 1.74774 | 1.62852 | 0.07179 | 0.06605 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.22849 | 0.00487 | 2.15229 | 3.56761 | 0.09240 | 0.08501 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.17717 | 0.00489 | 1.80740 | 3.48712 | 0.05440 | 0.05005 |

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.45492 | 529.26501 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02138 | 0.00428 | 527.06992 | 528.87869 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02148 | 0.00430 | 529.61807 | 531.43559 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.16405 | 0.00191 | 0.08017 | 2.63443 | 0.00450 | 0.00398 | 0.02318 |
| LDGT | 0.17045 | 0.00251 | 0.12705 | 2.90633 | 0.00619 | 0.00548 | 0.02489 |
| HDGV | 0.70192 | 0.00606 | 0.66705 | 11.59795 | 0.02334 | 0.02064 | 0.05074 |
| LDDV | 0.06754 | 0.00094 | 0.05768 | 2.38558 | 0.00240 | 0.00221 | 0.00820 |
| LDDT | 0.06604 | 0.00115 | 0.08885 | 1.88730 | 0.00314 | 0.00289 | 0.00857 |
| HDDV | 0.09275 | 0.00401 | 2.13027 | 1.42148 | 0.02859 | 0.02631 | 0.03212 |
| MC | 2.32377 | 0.00259 | 0.68502 | 12.40614 | 0.02346 | 0.02075 | 0.05483 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01170 | 0.00436 | 287.75348 | 289.34420 |
| LDGT | 0.01282 | 0.00625 | 377.15067 | 379.33207 |
| HDGV | 0.05692 | 0.02577 | 911.61519 | 920.70670 |
| LDDV | 0.04018 | 0.00068 | 281.68792 | 282.89262 |
| LDDT | 0.03523 | 0.00098 | 344.55815 | 345.73085 |
| HDDV | 0.02947 | 0.00308 | 1196.71174 | 1198.36499 |
| MC | 0.10794 | 0.00292 | 390.43717 | 394.00689 |

### 6.1.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

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

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

**- Vehicle Exhaust Emissions per Phase**

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

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

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

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

**- Worker Trips Emissions per Phase**

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

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

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

$V_{POL}$: Vehicle Emissions (TONs)

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

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

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

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

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

## 6.2 Architectural Coatings Phase

### 6.2.1 Architectural Coatings Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 6
**Start Quarter:** 1
**Start Year:** 2028

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

### 6.2.2 Architectural Coatings Phase Assumptions

**- General Architectural Coatings Information**
**Building Category:** Non-Residential
**Total Square Footage ($ft^2$):** 8500
**Number of Units:** N/A

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

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

**- Worker Trips Vehicle Mixture (%)**

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

### 6.2.3 Architectural Coatings Phase Emission Factor(s)

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.16405 | 0.00191 | 0.08017 | 2.63443 | 0.00450 | 0.00398 | 0.02318 |
| LDGT | 0.17045 | 0.00251 | 0.12705 | 2.90633 | 0.00619 | 0.00548 | 0.02489 |
| HDGV | 0.70192 | 0.00606 | 0.66705 | 11.59795 | 0.02334 | 0.02064 | 0.05074 |
| LDDV | 0.06754 | 0.00094 | 0.05768 | 2.38558 | 0.00240 | 0.00221 | 0.00820 |
| LDDT | 0.06604 | 0.00115 | 0.08885 | 1.88730 | 0.00314 | 0.00289 | 0.00857 |
| HDDV | 0.09275 | 0.00401 | 2.13027 | 1.42148 | 0.02859 | 0.02631 | 0.03212 |
| MC | 2.32377 | 0.00259 | 0.68502 | 12.40614 | 0.02346 | 0.02075 | 0.05483 |

**- Worker Trips Emission Factors (grams/mile)**

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01170 | 0.00436 | 287.75348 | 289.34420 |
| LDGT | 0.01282 | 0.00625 | 377.15067 | 379.33207 |
| HDGV | 0.05692 | 0.02577 | 911.61519 | 920.70670 |
| LDDV | 0.04018 | 0.00068 | 281.68792 | 282.89262 |
| LDDT | 0.03523 | 0.00098 | 344.55815 | 345.73085 |
| HDDV | 0.02947 | 0.00308 | 1196.71174 | 1198.36499 |
| MC | 0.10794 | 0.00292 | 390.43717 | 394.00689 |

### 6.2.4 Architectural Coatings Phase Formula(s)

**- Worker Trips Emissions per Phase**

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

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips ( 1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area ($ft^2$)
800: Conversion Factor square feet to man days ( 1 $ft^2$ / 1 man * day)

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

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

**- Off-Gassing Emissions per Phase**

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

$VOC_{AC}$: Architectural Coating VOC Emissions (TONs)
BA: Area of Building ($ft^2$)
2.0: Conversion Factor total area to coated area (2.0 $ft^2$ coated area / total area)
0.0116: Emission Factor ($lb/ft^2$)
2000: Conversion Factor pounds to tons

## 7. Construction / Demolition

### 7.1 General Information & Timeline Assumptions

# DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** PrSM Maintenance Facility - External Facility Components

**- Activity Description:**
Vehicle access to be provided:
• around the maintenance building
• around the covered testing pad
• to all other loading/unloading areas

• Parking –10 parking spaces (GOV and visitors)

**- Activity Start Date**
**Start Month:** 3
**Start Month:** 2028

**- Activity End Date**
**Indefinite:** False
**End Month:** 6
**End Month:** 2028

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.041441 |
| $SO_x$ | 0.000665 |
| $NO_x$ | 0.282874 |
| CO | 0.461518 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 0.010219 |
| PM 2.5 | 0.009397 |
| Pb | 0.000000 |
| $NH_3$ | 0.000651 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.002822 |
| $N_2O$ | 0.000626 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 71.421696 |
| $CO_2e$ | 71.678716 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.002822 |
| $N_2O$ | 0.000626 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 71.421696 |
| $CO_2e$ | 71.678716 |

## 7.1 Paving Phase

### 7.1.1 Paving Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 3
**Start Quarter:** 1
**Start Year:** 2028

**- Phase Duration**
**Number of Month:** 4
**Number of Days:** 0

### 7.1.2 Paving Phase Assumptions

**- General Paving Information**
**Paving Area ($ft^2$):** 234815

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

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cement and Mortar Mixers Composite | 4 | 6 |
| Pavers Composite | 1 | 8 |
| Paving Equipment Composite | 2 | 6 |
| Rollers Composite | 2 | 6 |
| Tractors/Loaders/Backhoes Composite | 1 | 7 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

### 7.1.3 Paving Phase Emission Factor(s)

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

| **Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.55275 | 0.00855 | 4.19697 | 3.25556 | 0.16292 | 0.14989 |
| **Pavers Composite [HP: 81] [LF: 0.42]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.21588 | 0.00486 | 2.33827 | 3.43520 | 0.10542 | 0.09699 |
| **Paving Equipment Composite [HP: 89] [LF: 0.36]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.16337 | 0.00488 | 1.88314 | 3.37709 | 0.05778 | 0.05316 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.50057 | 0.00542 | 3.50905 | 4.08429 | 0.13206 | 0.12150 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.17299 | 0.00489 | 1.74942 | 3.49553 | 0.04787 | 0.04404 |

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

| **Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02314 | 0.00463 | 570.33256 | 572.28980 |
| **Pavers Composite [HP: 81] [LF: 0.42]** | | | | |

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| Emission Factors | 0.02133 | 0.00427 | 525.89644 | 527.70118 |
| **Paving Equipment Composite [HP: 89] [LF: 0.36]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02141 | 0.00428 | 527.90982 | 529.72147 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02382 | 0.00476 | 587.11688 | 589.13172 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02148 | 0.00430 | 529.56544 | 531.38277 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.16405 | 0.00191 | 0.08017 | 2.63443 | 0.00450 | 0.00398 | 0.02318 |
| LDGT | 0.17045 | 0.00251 | 0.12705 | 2.90633 | 0.00619 | 0.00548 | 0.02489 |
| HDGV | 0.70192 | 0.00606 | 0.66705 | 11.59795 | 0.02334 | 0.02064 | 0.05074 |
| LDDV | 0.06754 | 0.00094 | 0.05768 | 2.38558 | 0.00240 | 0.00221 | 0.00820 |
| LDDT | 0.06604 | 0.00115 | 0.08885 | 1.88730 | 0.00314 | 0.00289 | 0.00857 |
| HDDV | 0.09275 | 0.00401 | 2.13027 | 1.42148 | 0.02859 | 0.02631 | 0.03212 |
| MC | 2.32377 | 0.00259 | 0.68502 | 12.40614 | 0.02346 | 0.02075 | 0.05483 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01170 | 0.00436 | 287.75348 | 289.34420 |
| LDGT | 0.01282 | 0.00625 | 377.15067 | 379.33207 |
| HDGV | 0.05692 | 0.02577 | 911.61519 | 920.70670 |
| LDDV | 0.04018 | 0.00068 | 281.68792 | 282.89262 |
| LDDT | 0.03523 | 0.00098 | 344.55815 | 345.73085 |
| HDDV | 0.02947 | 0.00308 | 1196.71174 | 1198.36499 |
| MC | 0.10794 | 0.00292 | 390.43717 | 394.00689 |

### 7.1.4 Paving Phase Formula(s)

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

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area ($ft^2$)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

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

$VOC_P$: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area ($ft^2$)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)

## 8. Construction / Demolition

### 8.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** Voelz Gate - Demolition and Construction of 3 Buildings

**- Activity Description:**
Army Standards for Access Control Point set requirements:
Three buildings required:

Gatehouse Building – 700 SF
• Includes command and control, storage, and restroom
• Ballistic resistant construction: UL 752-Level 3 or higher

Search Building – 1000 SF
• Can be combined with Gatehouse
• Includes staff facilities (office, break room, restroom, and storage)
• Ballistic resistant construction: UL 752-Level 3 or higher

Overwatch Building – 40 SF
• Positioned for 360 degree field of view
• Ballistic resistant construction: UL 752-Level 3 or higher

Vehicle Access
• New intersection with PA 997
• Access roads to be laid out to minimize tractor trailer speeds

Parking/Queuing
• Minimum of 25 spaces for inbound traffic (20 ftx 80 ft)
• Approximately 100 spaces for empty outbound trailers (15 ftx 60 ft)
• GOVs –one per employee + 1 handicapped

Physical Security
• Perimeter security fence around entire ACP
• AVB located to be operated by Gatehouse or Overwatch personnel

Demolition to occur of existing Voelz Gate: 1-to-1 demolition (equal to size of proposed facility) will be required in DD 1391.

Project elements analyzed in this specific ACAM component are -

(CONSTRUCTION):
Gatehouse Building – 700 SF
Search Building – 1000 SF
Overwatch Building – 40 SF
Total Paved Area - 555,786 SF
(Includes vehicles lanes, space for commercial vehicles/empty outbound vehicles, road connection to PA Route 997, etc.)

(DEMOLITION):
The proposed Voelz Gate will replace the existing ACP. This will require demolition of the existing ACP once construction is complete.
Voelz Gate - 700 SF

**- Activity Start Date**
**Start Month:** 9
**Start Month:** 2026

**- Activity End Date**
**Indefinite:** False
**End Month:** 8
**End Month:** 2028

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.261024 |
| $SO_x$ | 0.005250 |
| $NO_x$ | 2.162594 |
| CO | 2.767894 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 23.488080 |
| PM 2.5 | 0.079396 |
| Pb | 0.000000 |
| $NH_3$ | 0.002095 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.023270 |
| $N_2O$ | 0.004845 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 579.291033 |
| $CO_2e$ | 581.316255 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.023270 |
| $N_2O$ | 0.004845 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 579.291033 |
| $CO_2e$ | 581.316255 |

### 8.1 Demolition Phase

#### 8.1.1 Demolition Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 6
**Start Quarter:** 1
**Start Year:** 2028

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

#### 8.1.2 Demolition Phase Assumptions

**- General Demolition Information**
**Area of Building to be demolished ($ft^2$):** 700
**Height of Building to be demolished (ft):** 12

**- Default Settings Used:** Yes

**- Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

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

**- Vehicle Exhaust**
**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

**- Worker Trips**

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

**- Worker Trips Vehicle Mixture (%)**

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

### 8.1.3 Demolition Phase Emission Factor(s)

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

| Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73] | | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.37038 | 0.00743 | 3.34376 | 4.27147 | 0.05770 | 0.05308 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.34206 | 0.00492 | 3.04082 | 2.66346 | 0.13374 | 0.12304 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.17299 | 0.00489 | 1.74942 | 3.49553 | 0.04787 | 0.04404 |

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

| Concrete/Industrial Saws Composite [HP: 33] [LF: 0.73] | | | | |
|---|---|---|---|---|
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02330 | 0.00466 | 574.37549 | 576.34660 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02162 | 0.00432 | 532.85820 | 534.68684 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02148 | 0.00430 | 529.56544 | 531.38277 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.17041 | 0.00196 | 0.08731 | 2.77727 | 0.00459 | 0.00406 | 0.02337 |
| LDGT | 0.17953 | 0.00255 | 0.14323 | 3.04901 | 0.00627 | 0.00554 | 0.02509 |
| HDGV | 0.73514 | 0.00605 | 0.74827 | 12.39641 | 0.02441 | 0.02159 | 0.05103 |
| LDDV | 0.07335 | 0.00098 | 0.06912 | 2.70575 | 0.00251 | 0.00231 | 0.00820 |
| LDDT | 0.07182 | 0.00117 | 0.09975 | 1.94406 | 0.00315 | 0.00290 | 0.00857 |
| HDDV | 0.10225 | 0.00411 | 2.25690 | 1.46515 | 0.03428 | 0.03154 | 0.03227 |
| MC | 2.33129 | 0.00259 | 0.68674 | 12.53711 | 0.02345 | 0.02075 | 0.05451 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01235 | 0.00445 | 294.53825 | 296.17024 |
| LDGT | 0.01381 | 0.00649 | 383.94708 | 386.22265 |
| HDGV | 0.06125 | 0.02727 | 910.04397 | 919.69038 |
| LDDV | 0.04273 | 0.00068 | 292.66003 | 293.92840 |
| LDDT | 0.03571 | 0.00098 | 348.79466 | 349.97947 |
| HDDV | 0.02975 | 0.00307 | 1226.44620 | 1228.10448 |
| MC | 0.10932 | 0.00292 | 390.34183 | 393.94585 |

### 8.1.4 Demolition Phase Formula(s)

**- Fugitive Dust Emissions per Phase**

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

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor ($lb/ft^3$)
BA: Area of Building to be demolished ($ft^2$)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

**- Construction Exhaust Emissions per Phase**
$CEE_{POL}$ = (NE * WD * H * HP * LF * $EF_{POL}$* 0.002205) / 2000

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE}$ = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish ($ft^2$)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT}$ = WD * WT * 1.25 * NE

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

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

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

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

## 8.2 Site Grading Phase

### 8.2.1 Site Grading Phase Timeline Assumptions

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

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

### 8.2.2 Site Grading Phase Assumptions

**- General Site Grading Information**
**Area of Site to be Graded ($ft^2$):** 784080
**Amount of Material to be Hauled On-Site ($yd^3$):** 1000
**Amount of Material to be Hauled Off-Site ($yd^3$):** 1000

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

**- Construction Exhaust (default)**

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

**- Vehicle Exhaust**
**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

### 8.2.3 Site Grading Phase Emission Factor(s)

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

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.39317 | 0.00542 | 3.40690 | 4.22083 | 0.09860 | 0.09071 |
| **Graders Composite [HP: 148] [LF: 0.41]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.31292 | 0.00490 | 2.52757 | 3.39734 | 0.14041 | 0.12918 |
| **Other Construction Equipment Composite [HP: 82] [LF: 0.42]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.28160 | 0.00487 | 2.73375 | 3.50416 | 0.15811 | 0.14546 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.35280 | 0.00491 | 3.22260 | 2.72624 | 0.14205 | 0.13069 |
| **Scrapers Composite [HP: 423] [LF: 0.48]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19606 | 0.00488 | 1.74061 | 1.53912 | 0.06788 | 0.06245 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.18406 | 0.00489 | 1.88476 | 3.48102 | 0.06347 | 0.05839 |

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

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02381 | 0.00476 | 587.02896 | 589.04350 |
| **Graders Composite [HP: 148] [LF: 0.41]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02153 | 0.00431 | 530.81500 | 532.63663 |
| **Other Construction Equipment Composite [HP: 82] [LF: 0.42]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.54121 | 529.35159 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02160 | 0.00432 | 532.54993 | 534.37751 |
| **Scrapers Composite [HP: 423] [LF: 0.48]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02145 | 0.00429 | 528.85412 | 530.66901 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.70686 | 531.52468 |

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

| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$NH_3$** |
|---|---|---|---|---|---|---|---|
| LDGV | 0.17041 | 0.00196 | 0.08731 | 2.77727 | 0.00459 | 0.00406 | 0.02337 |
| LDGT | 0.17953 | 0.00255 | 0.14323 | 3.04901 | 0.00627 | 0.00554 | 0.02509 |
| HDGV | 0.73514 | 0.00605 | 0.74827 | 12.39641 | 0.02441 | 0.02159 | 0.05103 |
| LDDV | 0.07335 | 0.00098 | 0.06912 | 2.70575 | 0.00251 | 0.00231 | 0.00820 |
| LDDT | 0.07182 | 0.00117 | 0.09975 | 1.94406 | 0.00315 | 0.00290 | 0.00857 |
| HDDV | 0.10225 | 0.00411 | 2.25690 | 1.46515 | 0.03428 | 0.03154 | 0.03227 |
| MC | 2.33129 | 0.00259 | 0.68674 | 12.53711 | 0.02345 | 0.02075 | 0.05451 |

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

| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| LDGV | 0.01235 | 0.00445 | 294.53825 | 296.17024 |
| LDGT | 0.01381 | 0.00649 | 383.94708 | 386.22265 |
| HDGV | 0.06125 | 0.02727 | 910.04397 | 919.69038 |
| LDDV | 0.04273 | 0.00068 | 292.66003 | 293.92840 |
| LDDT | 0.03571 | 0.00098 | 348.79466 | 349.97947 |
| HDDV | 0.02975 | 0.00307 | 1226.44620 | 1228.10448 |
| MC | 0.10932 | 0.00292 | 390.34183 | 393.94585 |

### 8.2.4 Site Grading Phase Formula(s)

**- Fugitive Dust Emissions per Phase**
$PM10_{FD} = (20 * ACRE * WD) / 2000$

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

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
$HA_{OnSite}$: Amount of Material to be Hauled On-Site ($yd^3$)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site ($yd^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

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

## 8.3 Building Construction Phase

### 8.3.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 12
**Start Quarter:** 1
**Start Year:** 2026

**- Phase Duration**
**Number of Month:** 16
**Number of Days:** 0

### 8.3.2 Building Construction Phase Assumptions

**- General Building Construction Information**
**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 1740
**Height of Building (ft):** 20
**Number of Units:** N/A

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

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cranes Composite | 1 | 4 |
| Forklifts Composite | 2 | 6 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

**- Vendor Trips**

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

**- Vendor Trips Vehicle Mixture (%)**

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

### 8.3.3 Building Construction Phase Emission Factor(s)

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19758 | 0.00487 | 1.83652 | 1.63713 | 0.07527 | 0.06925 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.24594 | 0.00487 | 2.34179 | 3.57902 | 0.11182 | 0.10287 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.18406 | 0.00489 | 1.88476 | 3.48102 | 0.06347 | 0.05839 |

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.46069 | 529.27080 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02138 | 0.00428 | 527.09717 | 528.90603 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.70686 | 531.52468 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.17041 | 0.00196 | 0.08731 | 2.77727 | 0.00459 | 0.00406 | 0.02337 |
| LDGT | 0.17953 | 0.00255 | 0.14323 | 3.04901 | 0.00627 | 0.00554 | 0.02509 |
| HDGV | 0.73514 | 0.00605 | 0.74827 | 12.39641 | 0.02441 | 0.02159 | 0.05103 |
| LDDV | 0.07335 | 0.00098 | 0.06912 | 2.70575 | 0.00251 | 0.00231 | 0.00820 |
| LDDT | 0.07182 | 0.00117 | 0.09975 | 1.94406 | 0.00315 | 0.00290 | 0.00857 |
| HDDV | 0.10225 | 0.00411 | 2.25690 | 1.46515 | 0.03428 | 0.03154 | 0.03227 |
| MC | 2.33129 | 0.00259 | 0.68674 | 12.53711 | 0.02345 | 0.02075 | 0.05451 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01235 | 0.00445 | 294.53825 | 296.17024 |
| LDGT | 0.01381 | 0.00649 | 383.94708 | 386.22265 |
| HDGV | 0.06125 | 0.02727 | 910.04397 | 919.69038 |
| LDDV | 0.04273 | 0.00068 | 292.66003 | 293.92840 |
| LDDT | 0.03571 | 0.00098 | 348.79466 | 349.97947 |
| HDDV | 0.02975 | 0.00307 | 1226.44620 | 1228.10448 |
| MC | 0.10932 | 0.00292 | 390.34183 | 393.94585 |

### 8.3.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

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

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

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

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

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

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

$VMT_{VT}$: Vender Trips Vehicle Miles Travel (miles)

BA: Area of Building ($ft^2$)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor $ft^3$ to trips (0.38 trip / 1000 $ft^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

## 8.4 Paving Phase

### 8.4.1 Paving Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 3
**Start Quarter:** 1
**Start Year:** 2028

**- Phase Duration**
**Number of Month:** 4
**Number of Days:** 0

### 8.4.2 Paving Phase Assumptions

**- General Paving Information**
**Paving Area ($ft^2$):** 555786

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

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Pavers Composite | 1 | 8 |
| Paving Equipment Composite | 2 | 8 |
| Rollers Composite | 2 | 6 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

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

**- Worker Trips Vehicle Mixture (%)**

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

### 8.4.3 Paving Phase Emission Factor(s)

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

| Pavers Composite [HP: 81] [LF: 0.42] | | | | | | |
|---|---|---|---|---|---|---|
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.21588 | 0.00486 | 2.33827 | 3.43520 | 0.10542 | 0.09699 |
| **Paving Equipment Composite [HP: 89] [LF: 0.36]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.16337 | 0.00488 | 1.88314 | 3.37709 | 0.05778 | 0.05316 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | | | |
| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 |
| Emission Factors | 0.50057 | 0.00542 | 3.50905 | 4.08429 | 0.13206 | 0.12150 |

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

| Pavers Composite [HP: 81] [LF: 0.42] | | | | |
|---|---|---|---|---|
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02133 | 0.00427 | 525.89644 | 527.70118 |
| **Paving Equipment Composite [HP: 89] [LF: 0.36]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02141 | 0.00428 | 527.90982 | 529.72147 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | |
| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
| Emission Factors | 0.02382 | 0.00476 | 587.11688 | 589.13172 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.17041 | 0.00196 | 0.08731 | 2.77727 | 0.00459 | 0.00406 | 0.02337 |
| LDGT | 0.17953 | 0.00255 | 0.14323 | 3.04901 | 0.00627 | 0.00554 | 0.02509 |
| HDGV | 0.73514 | 0.00605 | 0.74827 | 12.39641 | 0.02441 | 0.02159 | 0.05103 |
| LDDV | 0.07335 | 0.00098 | 0.06912 | 2.70575 | 0.00251 | 0.00231 | 0.00820 |
| LDDT | 0.07182 | 0.00117 | 0.09975 | 1.94406 | 0.00315 | 0.00290 | 0.00857 |
| HDDV | 0.10225 | 0.00411 | 2.25690 | 1.46515 | 0.03428 | 0.03154 | 0.03227 |
| MC | 2.33129 | 0.00259 | 0.68674 | 12.53711 | 0.02345 | 0.02075 | 0.05451 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01235 | 0.00445 | 294.53825 | 296.17024 |
| LDGT | 0.01381 | 0.00649 | 383.94708 | 386.22265 |
| HDGV | 0.06125 | 0.02727 | 910.04397 | 919.69038 |
| LDDV | 0.04273 | 0.00068 | 292.66003 | 293.92840 |
| LDDT | 0.03571 | 0.00098 | 348.79466 | 349.97947 |
| HDDV | 0.02975 | 0.00307 | 1226.44620 | 1228.10448 |
| MC | 0.10932 | 0.00292 | 390.34183 | 393.94585 |

### 8.4.4 Paving Phase Formula(s)

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

**- Construction Exhaust Emissions per Phase**

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

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

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE}$ = PA * 0.25 * (1 / 27) * (1 / HC) * HT

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area ($ft^2$)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

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

**- Worker Trips Emissions per Phase**
$VMT_{WT}$ = WD * WT * 1.25 * NE

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

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

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

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

$VOC_P$: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)

PA: Paving Area ($ft^2$)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)

## 9. Construction / Demolition

### 9.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** Voelz Gate - Truck Inspection Canopies (3 Separate Canopies)

**- Activity Description:**
General Description: The external components of the Voelz Gate Facility include those items located outside of and in support of the personnel performing inspections of inbound and outbound traffic to LEAD/LEMC. The total proposed construction includes one outbound and two inbound vehicle lanes, queuing space for an estimated 26 commercial vehicles, 100 parking spaces for empty outbound vehicles, up to three individual buildings, and three truck inspection canopies.

Inspection Areas:
• The inbound inspection area requires two lanes for inspection of multiple vehicles simultaneously and the outbound inspection area requires one lane for inspection purposes.
• Each inspection area will include canopies covering the inspection areas with a vertical clearance of 20 ft, 80 ft in length, and 20 ft in width
• Truck inspection canopy, three seperate canopies, each estimated at 2,240 SF, totaling 6,720 SF.

Holding area (inbound):
• Material - Asphalt
• Number of - A minimum of 25 spaces for tractor trailer
• Parking space dimensions - 20’ by 80’
• Location - Prior to inspection areas
• Design - The purpose of the parking is for queuing of trucks prior to entering and spaces will be stacked in a linear fashion with multiple lanes of parking spaces

Holding area (Outbound):
• Material - Asphalt
• Number of - A minimum of 100 trailer spaces
• Parking space dimensions - 15’ by 60’
• Location - Following the outbound inspection area, only accessible from outbound lanes
• Design - The purpose of the parking is for storage of empty trailers. The layout of the parking spaces will be such that trailers can be backed in to wait for removal at later date; no one space will be blocked by another

The Facility will include three seperate inspection canopies:
- Inspection Canopies: 6,720 SF. This project element is analyzed in this specific ACAM component.

**- Activity Start Date**
**Start Month:** 12
**Start Month:** 2026

**- Activity End Date**
**Indefinite:** False
**End Month:** 3
**End Month:** 2027

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.018719 |
| $SO_x$ | 0.000428 |
| $NO_x$ | 0.164887 |
| CO | 0.244604 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 0.006728 |
| PM 2.5 | 0.006188 |
| Pb | 0.000000 |
| $NH_3$ | 0.000235 |

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.001912 |
| $N_2O$ | 0.000409 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 47.338854 |
| $CO_2e$ | 47.508551 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.001912 |
| $N_2O$ | 0.000409 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 47.338854 |
| $CO_2e$ | 47.508551 |

### 9.1 Building Construction Phase

### 9.1.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 12
**Start Quarter:** 1
**Start Year:** 2026

**- Phase Duration**
**Number of Month:** 4
**Number of Days:** 0

### 9.1.2 Building Construction Phase Assumptions

**- General Building Construction Information**
**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 6720
**Height of Building (ft):** 1
**Number of Units:** N/A

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

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cranes Composite | 1 | 4 |
| Forklifts Composite | 2 | 6 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

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

**- Worker Trips**

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

**- Worker Trips Vehicle Mixture (%)**

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

**- Vendor Trips**

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

**- Vendor Trips Vehicle Mixture (%)**

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

### 9.1.3 Building Construction Phase Emission Factor(s)

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19758 | 0.00487 | 1.83652 | 1.63713 | 0.07527 | 0.06925 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.24594 | 0.00487 | 2.34179 | 3.57902 | 0.11182 | 0.10287 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.18406 | 0.00489 | 1.88476 | 3.48102 | 0.06347 | 0.05839 |

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

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.46069 | 529.27080 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02138 | 0.00428 | 527.09717 | 528.90603 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.70686 | 531.52468 |

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

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.17041 | 0.00196 | 0.08731 | 2.77727 | 0.00459 | 0.00406 | 0.02337 |
| LDGT | 0.17953 | 0.00255 | 0.14323 | 3.04901 | 0.00627 | 0.00554 | 0.02509 |
| HDGV | 0.73514 | 0.00605 | 0.74827 | 12.39641 | 0.02441 | 0.02159 | 0.05103 |
| LDDV | 0.07335 | 0.00098 | 0.06912 | 2.70575 | 0.00251 | 0.00231 | 0.00820 |
| LDDT | 0.07182 | 0.00117 | 0.09975 | 1.94406 | 0.00315 | 0.00290 | 0.00857 |
| HDDV | 0.10225 | 0.00411 | 2.25690 | 1.46515 | 0.03428 | 0.03154 | 0.03227 |
| MC | 2.33129 | 0.00259 | 0.68674 | 12.53711 | 0.02345 | 0.02075 | 0.05451 |

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

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01235 | 0.00445 | 294.53825 | 296.17024 |
| LDGT | 0.01381 | 0.00649 | 383.94708 | 386.22265 |
| HDGV | 0.06125 | 0.02727 | 910.04397 | 919.69038 |
| LDDV | 0.04273 | 0.00068 | 292.66003 | 293.92840 |
| LDDT | 0.03571 | 0.00098 | 348.79466 | 349.97947 |
| HDDV | 0.02975 | 0.00307 | 1226.44620 | 1228.10448 |
| MC | 0.10932 | 0.00292 | 390.34183 | 393.94585 |

### 9.1.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

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

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

**- Vehicle Exhaust Emissions per Phase**

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

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

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

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

**- Worker Trips Emissions per Phase**

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

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

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

$V_{POL}$: Vehicle Emissions (TONs)

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

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

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

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

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

## 10. Emergency Generator

### 10.1 General Information & Timeline Assumptions

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

**- Activity Location**
**County:** Franklin
**Regulatory Area(s):** NOT IN A REGULATORY AREA; Franklin Co, PA

**- Activity Title:** Voelz Gate - Emergency Generator

**- Activity Description:**
Backup Power - A back-up power system will be required to be provided with a generator and UPS. This shall be done through equipment located adjacent to the building at the Voelz Gate or through centralized equipment feeding power to the building and exterior lighting as required. These systems are required to power critical security and safety elements of the facility.

**- Activity Start Date**
**Start Month:** 9
**Start Year:** 2028

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

**- Activity Emissions of Criteria Pollutants:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.011300 |
| $SO_x$ | 0.009518 |
| $NO_x$ | 0.046575 |
| CO | 0.031104 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 10 | 0.010166 |
| PM 2.5 | 0.010166 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |

**- Global Scale Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| $CH_4$ | 0.000188 |
| $N_2O$ | 0.000037 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| $CO_2$ | 4.657500 |
| $CO_2e$ | 5.386500 |

## 10.2 Emergency Generator Assumptions

**- Emergency Generator**
**Type of Fuel used in Emergency Generator:** Diesel
**Number of Emergency Generators:** 2

**- Default Settings Used:** Yes

**- Emergency Generators Consumption**
**Emergency Generator's Horsepower:** 135 (default)
**Average Operating Hours Per Year (hours):** 30 (default)

## 10.3 Emergency Generator Emission Factor(s)

**- Emergency Generators Criteria Pollutant Emission Factor (lb/hp-hr)**

| VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ |
|---|---|---|---|---|---|---|---|
| 0.00279 | 0.00235 | 0.0115 | 0.00768 | 0.00251 | 0.00251 | | |

**- Emergency Generators Pollutant Emission Factor (lb/hp-hr)**

| $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|
| 0.000046297 | 0.000009259 | 1.15 | 1.33 |

## 10.4 Emergency Generator Formula(s)

**- Emergency Generator Emissions per Year**
$AE_{POL} = (NGEN * HP * OT * EF_{POL}) / 2000$

$AE_{POL}$: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
$EF_{POL}$: Emission Factor for Pollutant (lb/hp-hr)

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# Appendix D
# Phase I Archeological Survey Report

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# Phase I Archaeological Survey for the Proposed MMF and Voelz Gate Letterkenny Army Depot Franklin County, Pennsylvania

Prepared by:

United States Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201

July 2025

## Abstract

In spring of 2025, the United States (U.S.) Army Corps of Engineers (USACE), Baltimore District performed a Phase I archaeological survey for the Letterkenny Army Depot (LEAD). The archaeological investigation was performed to support National Environmental Policy Act and National Historic Preservation Act compliance activities related to federal undertakings proposed for the Missile Maintenance Facility (MMF) and Voelz Gate Access Control Point (ACP) sites in Franklin County, Pennsylvania. The project locations are within the Roxbury 7.5-Minute U.S. Geological Survey Quadrangle. The direct Area of Potential Effects (APE), where ground-disturbing activities are expected to take place, includes 32-acres at the MMF site and 16-acres at the Voelz Gate ACP site, for a total approximately 48-acres.

In March 2025, USACE archaeologists conducted background research and records searches of the APE. The Phase I archaeological survey was performed by USACE from 14 April to 22 April 2025. A surface inspection and walkover was conducted prior to field activity. Archaeologists systematically excavated shovel test pits (STPs) on a 50-foot grid system in areas that have not been previously plowed or where plowing is not practicable. Shovel testing for areas previously plowed and within low and moderate probability areas were excavated at wider 100-foot intervals. Judgmentally selective STPs were excavated in areas previously disturbed by modern activity with low probability for containing archaeological resources. At the Voelz Gate ACP, controlled surface collection was conducted on a portion of the APE that is annually cultivated and had been recently disked on 16 April 2025. No archaeological sites were identified within the project areas. Based on the results of the Phase I identification and evaluation efforts, no further archaeological work is recommended for the MMF and Voelz Gate ACP sites.

**Table of Contents**

# 1 Introduction

In March-April 2025, the United States (U.S.) Army Corps of Engineers (USACE), Baltimore District performed a Phase I archaeological survey for Letterkenny Army Depot (LEAD). This report includes the background, methodology, results, and recommendations of the Phase I archaeological investigation for new proposed undertakings at Letterkenny Army Depot (LEAD) in Chambersburg, central Franklin County, Pennsylvania. The report has been prepared by the USACE Baltimore District at the request of LEAD.

The proposed project includes new construction and operation of the Precision Strike Missile Maintenance Facility (MMF) and the Voelz Gate Access Control Point (ACP). In addition, the proposed project also includes the demolition of the existing Voelz Gate ACP once the new ACP is operational (Figures 1-1 through 1-4). Support provided was in the performance of a Phase I archaeological survey at MMF and Voelz Gate ACP sites in Pennsylvania. This report will ultimately aid LEAD in the preparation of cultural resources documentation and compliance in accordance with applicable state and federal laws and regulations, to include the National Environmental Policy Act (NEPA), National Historic Preservation Act of 1966 (NHPA), Department of Defense (DoD) NEPA implementing guidance.

This report presents the objectives and tasks that were executed to complete the Phase I archaeological survey. Specific methods and techniques were developed based on the project's objectives and take into account the history of the property, landscape of the area, nature of potential subsurface archaeological deposits, and the results of previous archaeological investigations. This survey was conducted in accordance with guidelines and recommendations established by the Pennsylvania Historical and Museum Commission (PHMC) in the *Guidelines for Archaeological Investigations in Pennsylvania* (2021). The technical report conforms to the PHMC guidelines. This study was performed in accordance with the NHPA of 1966, as amended; *Procedures for the Protection of Historic and Cultural Properties* (36 Code of Federal Regulations (CFR) 800); *Procedures for Determining Site Eligibility for the National Register of Historic Places* (NRHP) (36 CFR 60 and 63); and the *Secretary of the Interior (SOI)'s Standards for Archaeology and Historic Preservation*. The Project Archaeologist meets the qualifications described in the SOI's *Professional Qualifications Standards* (Federal Register 48:190:44738-44739) (U.S. Department of the Interior 1983) and in 36 CFR 66.3(b)(2) and 36 CFR 61.

## 1.1 Project Information

LEAD has identified a need for assistance with the preparation of NEPA and NHPA compliance documentation for proposed undertakings related to demolition and new construction at the MMF and Voelz Gate ACP sites. The proposed undertakings include new construction and operation of the MMF and Voelz Gate ACP facilities and the demolition of the existing Voelz Gate ACP.

The project areas are in Franklin County in south central Pennsylvania. LEAD is located northwest of the intersection of Interstate 81 and U.S. Route 30, five miles north of Chambersburg, Pennsylvania. LEAD is the Cumberland Valley of south-central Pennsylvania. LEAD is regionally situated among the metropolitan areas of Pittsburgh, Pennsylvania, 130 miles to the northwest; Philadelphia, Pennsylvania, 135 miles to the east; Washington, DC, 90 miles to the south; and Baltimore, Maryland, 75 miles to the southeast and contains 17,700 acres of land.

The area around LEAD is served by Interstate 81, and U.S. Highways Number 11 and routes occurs at the primary entrance to LEAD. In addition, the Pennsylvania Turnpike is located 14 miles north of the facility. The area surrounding the LEAD is primarily agricultural, except to the west, which is state forest and state game land. There are several unincorporated residential and commercial developments contiguous to LEAD with the largest development, the Cumberland Valley Business Park located immediately to the east.

LEAD contains Letterkenny Munitions Center (LEMC) within its boundaries. LEMC is a U.S. Army, government-owned facility under the command of the Joint Munitions Command (JMC). LEMC conducts regional and global contingency distribution of munitions, provides missile maintenance, and conducts demilitarization of munitions for the Army in support of all DoD and international partners to provide readiness to the warfighter.

USACE archaeologists investigated the project areas to identify and evaluate the potential for archeological resources within the Area of Potential Effects (APE) to determine whether historic properties may be affected by the proposed undertakings. The APE for the proposed undertakings is within the total proposed 48-acre limits of disturbance (LOD) at the MMF and Voelz Gate ACP sites (encompassing 32-acres and 1-acres respectively) for the construction and demolition activities and those areas from which the proposed undertakings would be visible. The LOD is shown in Figure 1-3.

## 1.2 Purpose and Need

The purpose of the Proposed Action is to provide an effective and efficient maintenance facility (MF) that is compliant with Ammunition and Explosives Safety Standards as well as an ACP that is compliant with Entry Control Facility Standard for ACPs. Both facilities would be capable of supporting the DoD's new Precision Strike Missile (PrSM) mission proposed at LEMC. LEMC is operated by JMC as a tier one Army Strategic Mobility Platform that provides munitions support for all DoD organizations and is a Center of Industrial and Technical Excellence (CITE) for surveillance, receipt, storage, issue, testing and repair for multiple precision fire systems. The proposed MMF would serve as the main location for missile maintenance and the new ACP would provide critical commercial vehicle (tractor trailer) shipping and receiving operations to support the PrSM program.

Construction of a new MMF is needed as there are no facilities with the capacity or proper configuration to meet the PrSM system maintenance requirements on-site at LEMC. Proper configuration includes the Explosive Safety Quantity-Distance Arcs (ESQD Arcs) required by the MMF. ESQD Arcs are safety buffers intended to protect explosive mission functions from encroaching development while also protecting life and property from explosive hazards. New habitable structures cannot exist within existing ESQD Arcs and new facilities with explosive hazards cannot be located such that its ESQD Arcs encompass existing habitable structures. Due to the nature of facilities at LEMC, many existing buildings have ESQD Arcs encompassing areas around them, limiting development on previously developed areas at LEMC. Proposed components of the MMF include a maintenance building, storage building, outdoor covered test pad, as well as a covered forklift charging pad and a water storage tank to meet fire suppression requirements and would have an estimated limit of disturbance of 32 acres.

Additionally, the current ACP, Voelz Gate, which is used for commercial vehicle deliveries at LEMC, is undersized and does not meet current DoD standards. In its current state, the Voelz Gate, lacks sufficient space for commercial vehicles to queue prior to inspection before entering the Installation (Unified Facilities Criteria [UFC] standards for entry control ACPs). Therefore, demolition of the existing ACP and construction of an updated and DoD-compliant ACP is needed.

If this project is not provided, LEMC would be unable to meet Army and DoD mission standards or requirements for 1) Ammunition and explosives safety standards compliance for maintenance facilities or 2) Entry control standards for ACPs.

## 1.3 MMF

The total construction for the MMF is an estimated 32 acres of disturbance on the northeastern edge of LEMC. The proposed site location for the MMF is owned by LEMC; however, it is leased for private agricultural use. The proposed MMF construction includes perimeter fencing, roadways for inbound and outbound commercial vehicles, personnel parking, and four individual buildings, described below. Additionally, the MMF requires ESQD Arcs that do not encompass existing habitable structures.

1) Maintenance building
   a. Additional facilities included within the maintenance building include, administrative, parts and equipment storage, and staff spaces (breakrooms, lockers, conference rooms).
2) Inert storage building
3) Outdoor covered testing pad

The proposed MMF includes stormwater management ponds along with extensive grading necessary for building construction, and a parking area for government and commercial vehicles. Designs for the MMF would follow the standard design criteria for Rocket and Missile Maintenance Building and explosive safety criteria per *Defense Explosives Safety Regulation (DESR)* 6055.9 (02.2024) would be followed.

### 1.4 Voelz Gate

The total construction for the Voelz Gate ACP is an estimated 16 acres of disturbance. The proposed location, on the northwestern portion of LEMC, would encompass the existing ACP footprint and LEMC land that is currently leased for private agricultural use. The total proposed construction includes one outbound and two inbound vehicle lanes, queuing space for an estimated 26 commercial vehicles, 100 parking spaces for empty outbound vehicles, up to three individual buildings, and three truck inspection canopies. These are all described in detail below. Additionally, the proposed ACP must follow ESQD Arcs requirements and cannot be built within an existing ESQD Arc. The design would comply with UFC 4-022-01 *Security Engineering: Entry Control Facilities / Access Control Points* and applicable laws and executive orders.

1) Gatehouse building. Building design includes operational spaces and storage.
2) Search building would include staff facilities (breakroom, offices, and storage). This building could be combined into one facility with the Gatehouse building described above.
3) Overwatch
4) Truck inspection canopy, three separate canopies

The proposed Voelz Gate would replace the existing ACP. This would require demolition of the existing ACP once construction is complete. The proposed 100 parking spaces for empty outbound vehicles would be constructed on top of the former ACP footprint. The Voelz Gate ACP site was extended after this archeological investigation was done. The long, skinny eastern portion running east was not a part of this Phase I.

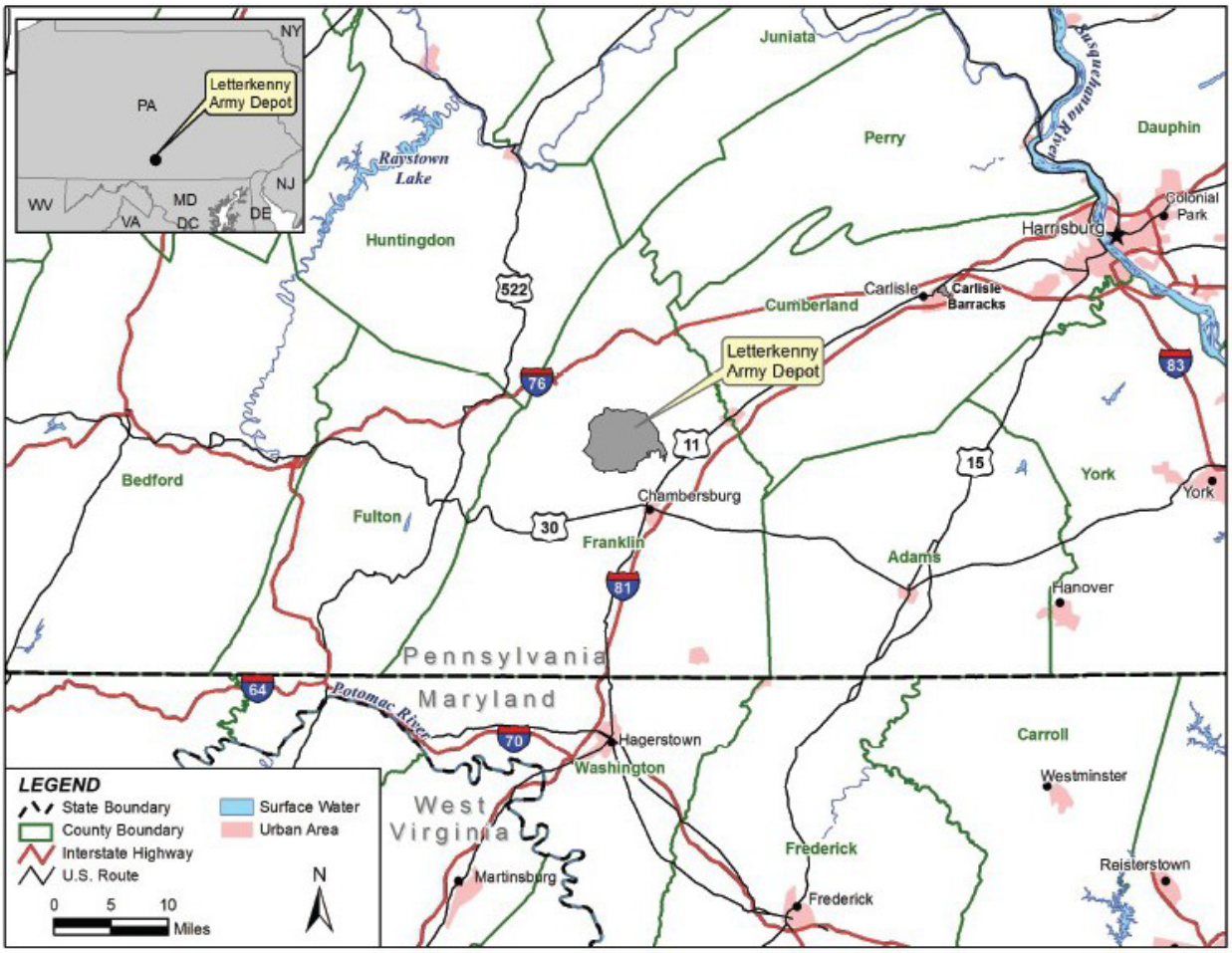


***Figure 1-1: Location of LEAD***

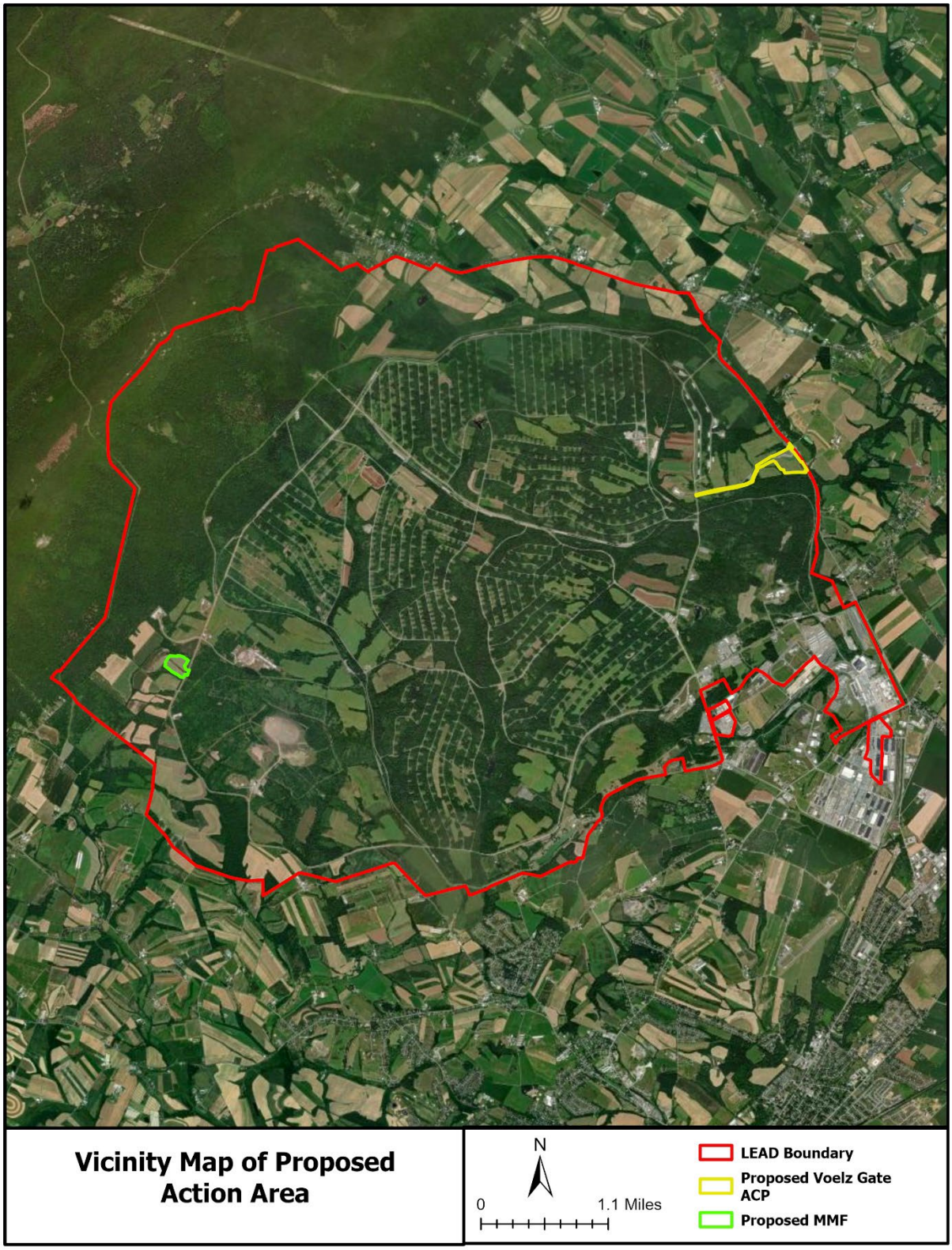


*Figure 1-2: Map of the Proposed Action*


*Figure 1-3: Proposed Limits of Disturbance*

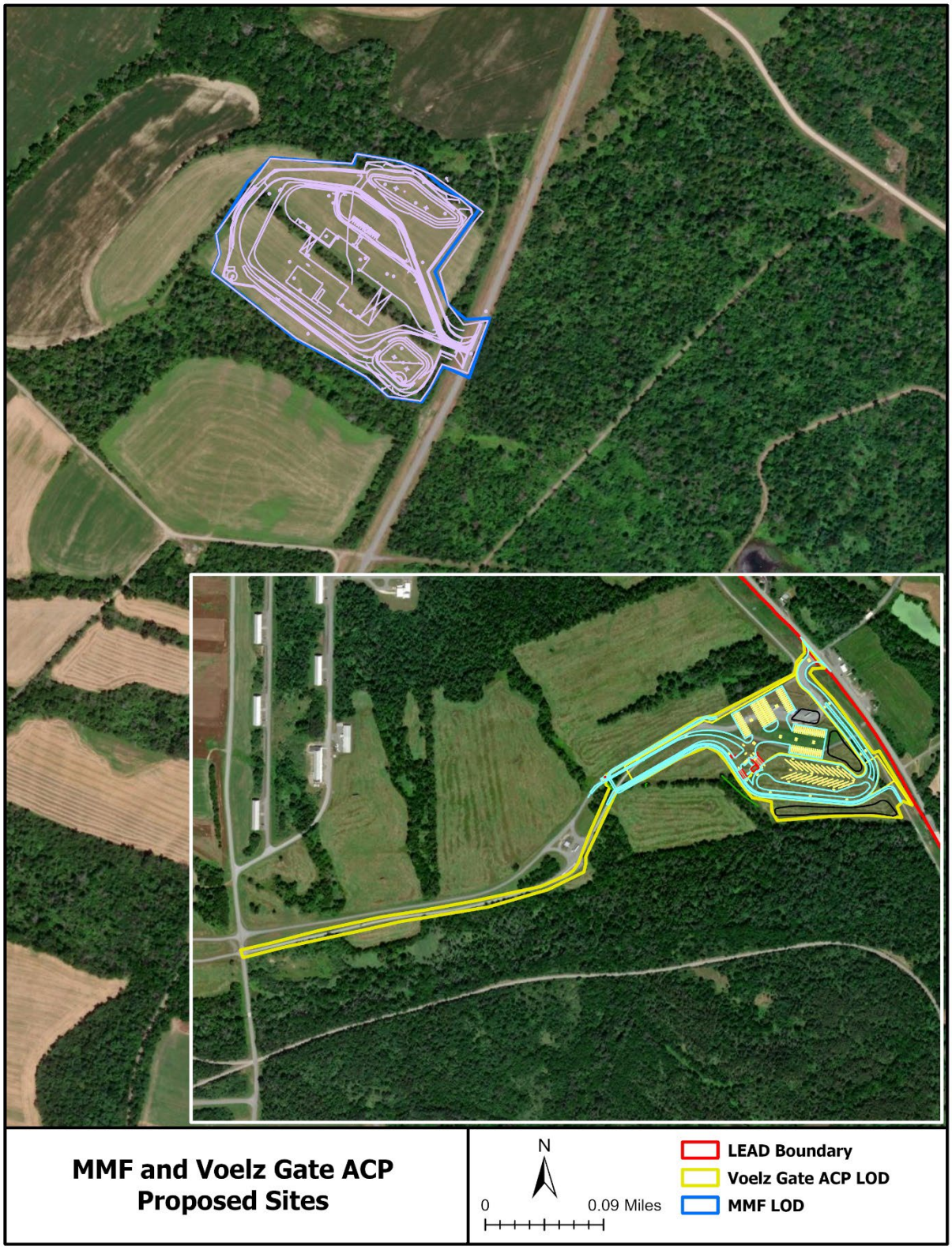


*Figure 1-4: Concept Designs for the Proposed Projects*

# 2 Environmental Setting

## 2.1 Physiography and Hydrology

LEAD is situated approximately 40 miles southwest of Harrisburg and the Susquehanna River and five miles north of Chambersburg. Located in the Ridge and Valley Physiographic Province, the topography of the area ranges from 800 feet above mean sea level (amsl) to 1,200 feet amsl and occasionally rises to heights of 2,000 feet amsl (Figure 2-1). The Ridge and Valley Province is characterized by long, thin ridges and broad, flat valleys that run obliquely across Pennsylvania (The Pennsylvania Science Office, 2004; LEAD, 2020).

LEAD is located approximately 40 miles southwest of the Susquehanna River. Keasey Run and its associated wetlands are located just north of LEAD, while Muddy Run bisects LEAD roughly through the middle, running east to west. Rocky Springs Lake and Lake Letterkenny are situated in the southern portion of LEAD. Various intermittent steams flow through LEAD as well. LEAD contains an ephemeral/fluctuating natural pool community with ponds located in wooded areas (The Pennsylvania Science Office 2004). Franklin County is drained by the Susquehanna and the Potomac Rivers (LEAD,2020).

The proposed Voelz Gate ACP is situated in uplands and has an unnamed tributary running west to east along its northern boundary. This tributary flows into Muddy Run to the north, off site. Muddy Run also borders the LOD to the south. The proposed MMF site contains one unnamed tributary that runs east to west, flowing along the northern boundary of the LOD. The unnamed tributary flows into Dennis Creek, which empties into Conococheague Creek to the south.

The proposed Voelz Gate ACP is within FEMA flood map area 42055C0167E, effective January 18, 2012. The proposed MMF is in FEMA flood map area 42055C0165E, effective January 18, 2012. These maps indicate that the proposed MMF and Voelz Gate ACP are entirely within Zone X, defined as an area determined to be outside of the 500-year flood and protected by levee from 100-year flood (Figure 2-2).

The proposed MMF site is also situated in uplands and has two wetlands on its northern border, visible in Figure 2-3. Wetland 1 is a Palustrine Emergent (PEM) Wetland that totals approximately 0.7 acres and lies to the northeast of the LOD, draining west into the unnamed tributary connecting Wetlands 1 and 2. Wetland 2 is also a PEM wetland, enveloping approximately 0.38 acres and drain wests into the unnamed tributary. Both wetlands are regulated by the Pennsylvania Department of Environmental Protection as well as by the USACE since they are not isolated.

The proposed Voelz Gate ACP does not contain any wetlands within its LOD; however, there are two wetlands just outside of its boundaries. The first wetland is to the north of LOD and connecting to an unnamed tributary. This wetland is a PEM wetland spanning approximately 0.09 acres. The second wetland is a large wetland surrounding Muddy Run to the south of the LOD. This is a palustrine forested (PFO) wetland (Figure 2-4). Only the northern boundary of the wetland was confirmed by USACE for purposes of the Proposed Action.

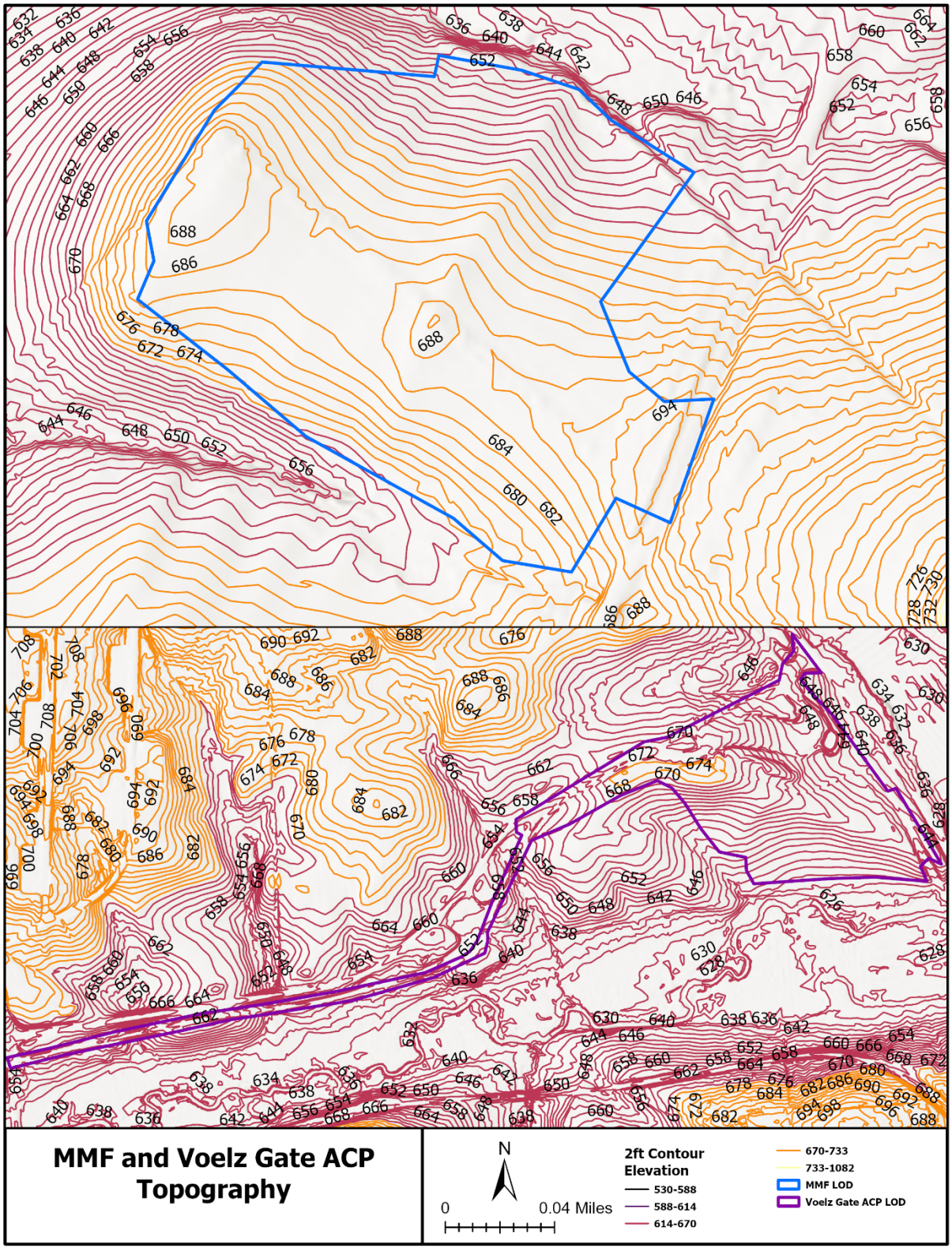


*Figure 2-1: Topography of the Proposed Sites*

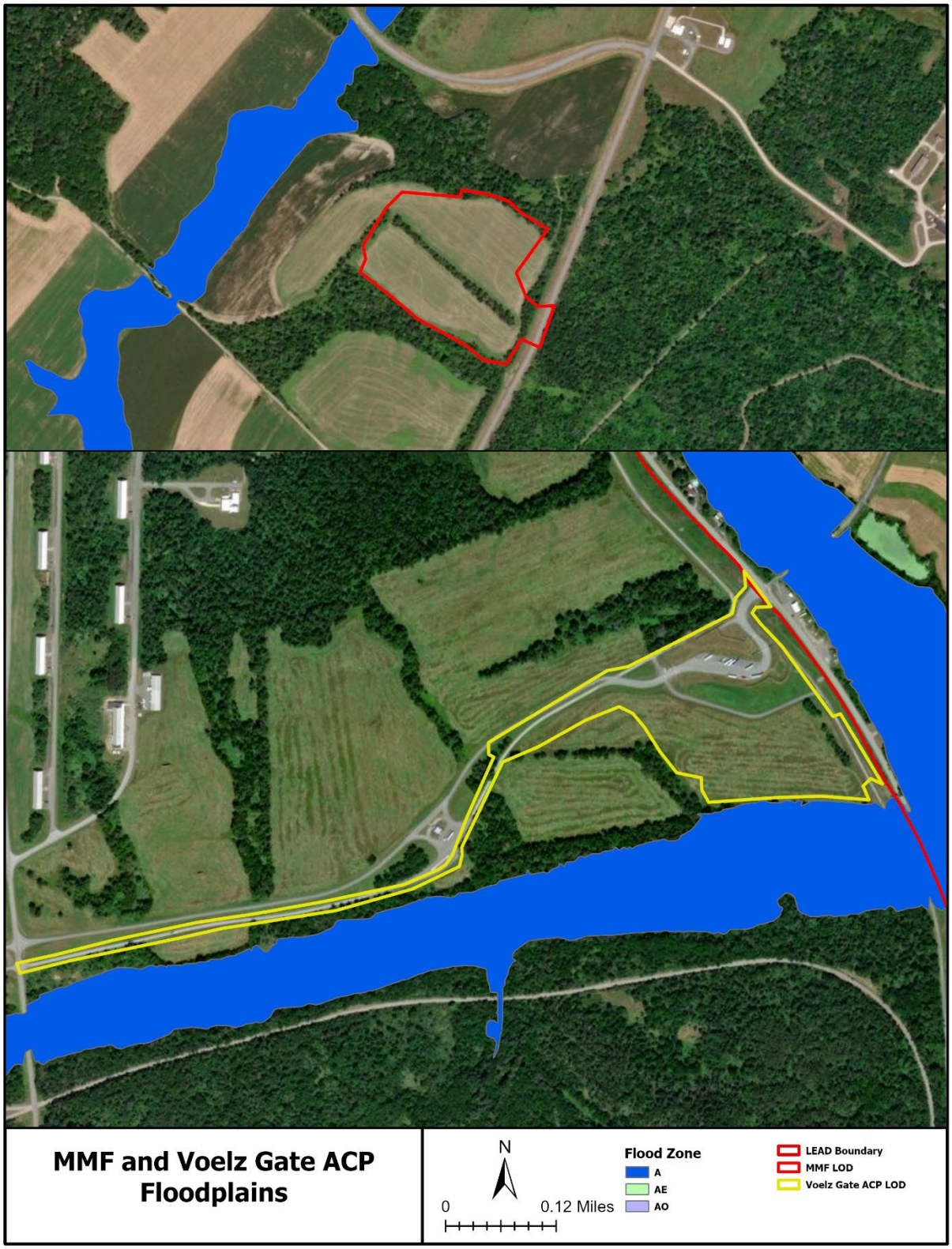


*Figure 2-2: Floodplains*

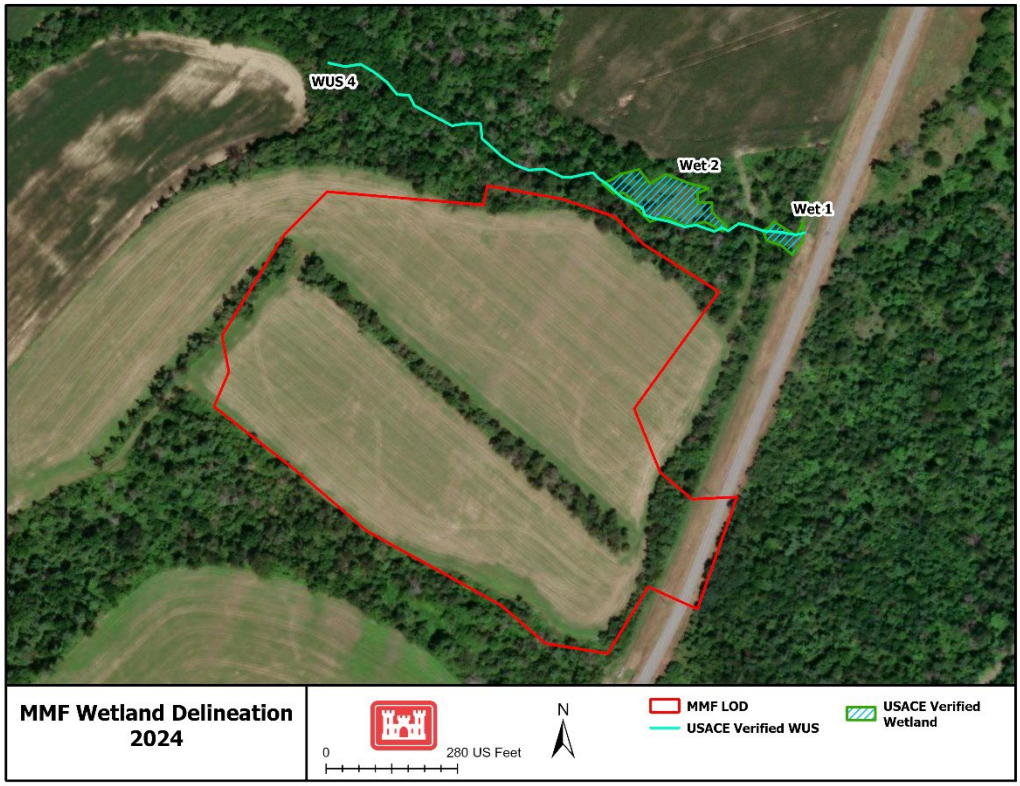


*Figure 2-3: MMF Wetlands*

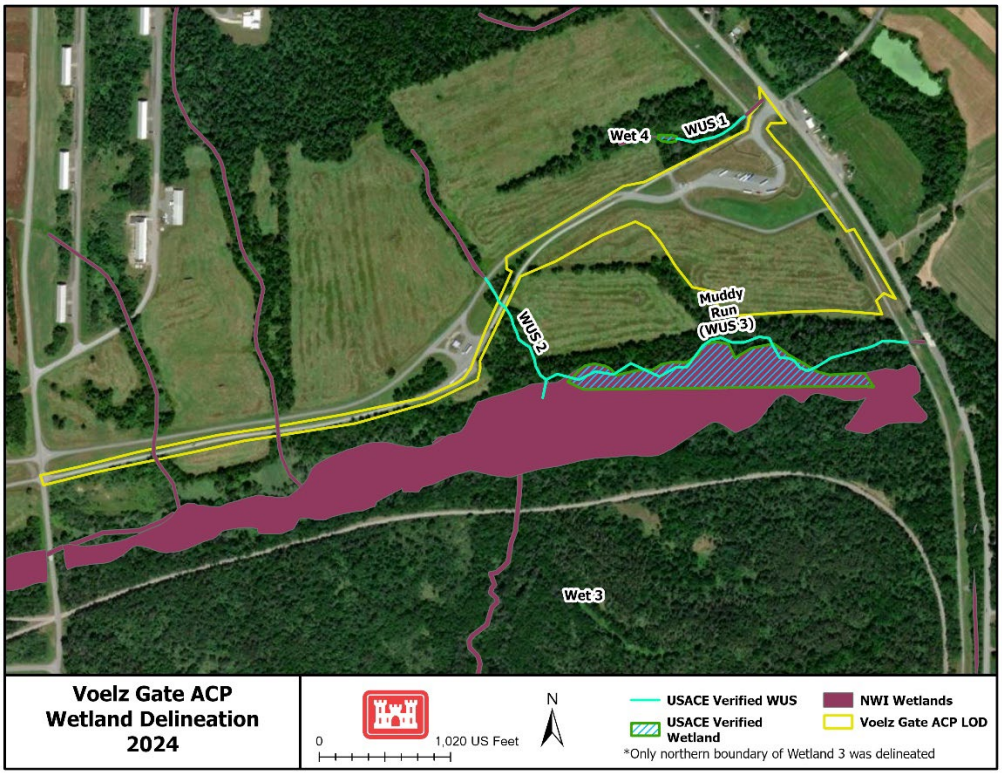


*Figure 2-4: Voelz Gate Wetlands*

## 2.2 Climate

Pennsylvania's climate is significantly shaped by several geographical factors. The Atlantic Ocean exerts a moderating influence on the coastal areas, while Lake Erie has a tempering effect on the northwestern part of the state. Throughout most of the year, prevailing westerly winds transport air masses from the North American interior across the entire region, occasionally bringing frigid temperatures during the winter. During the winter, the jet stream often hovers near or above the region, bringing about frequent storm systems, which leads to overcast skies, blustery conditions, and precipitation. Pennsylvania is susceptible to a range of extreme weather phenomena, including floods, tropical cyclones, heatwaves, cold spells, severe thunderstorms, snow and ice storms, and nor'easters (NCICS, 2022). Franklin County climate is characterized by warm and partly cloudy summers, while winters are freezing, snowy, and often cloudy. Throughout the year, temperatures usually range from 19°F to 80°F, with rare instances of dropping below 3°F or rising above 88°F (Weather Spark, 2023). Chambersburg, the largest city near LEAD, is typically warmest in July with an average high of 85°F, and January is the coldest month with an average low of 41°F. The driest month in the region is typically February, receiving an average of 6.81 centimeters (cm) (2.68 inches [in]) of rainfall. Conversely, May is the wettest month, with average precipitation of 10.69 cm (4.21 in). The annual average rainfall in the area is around 105.41 cm (41.5 in), and the mean annual temperature is approximately 51.8°F (LEAD, 2020; U.S. Climate Data, 2023).

## 2.3 Geology and Soils

LEAD straddles two major geologic structural features: the South Mountain Anticlinorium to the east and the Massanutten Synclinorium to the west. The eastern section of LEAD is underlain primarily by carbonate rocks (limestones and dolomites) and is part of the South Mountain Anticlinorium. The western section of LEAD is underlain primarily by shales and is part of the Massanutten Synclinorium. These regional geologic structures were formed as a result of folding that occurred during the Paleozoic era (225 million to 570 million years ago). In the eastern section of LEAD, high-angle reverse faulting accompanied the folding. As a result, several major faults, which strike north to northeast and dip to the southeast at fairly steep angles, occur on the LEAD (Weston, 1996). The Letterkenny Fault, which dips to the west; the Pinola Fault, which dips to the east and is to the west of the Letterkenny Fault; and an unnamed fault, which occurs between the Pinola and Letterkenny Faults; all occur in the excess area.

LEAD is underlain by five Ordivician-aged geologic formations (430 million to 500 million years old) of the Great Valley. The formations underlying the Installation include carbonate rocks of the Chambersburg formation, St. Paul Group, Rockdale Run formation, and Pinesburg Station formation and the shales and sandstones of the Martinsburg formation (Tetra, 2020). Based on the soil associations of the Proposed Action, which contain sandstone, siltstone, and sandstone parent material, it is likely the LODs fall within the Martinsburg Formation area.

The Martinsburg formation is late Ordivician in age and consists of thin-bedded, black, steeply inclined, extensively fractured shales. The formation contains interbedded layers of sandstones, siltstones, and some carbonates. The Martinsburg formation is more resistant to erosion than the limestones and dolomites of the St. Paul Group and Chambersburg formation and forms the gently rolling hills of the depot.

One of the main soil groups in Franklin County is the Weikert-Berks-Bedington Association: Ranging from shallow to deep, these soils can be found on nearly level areas to very steep areas, often in valleys. These soils are formed in weathered shale and interbedded shale, siltstone, and sandstone. Thirty-one percent of the county is covered in these soils. The Association is made up of approximately 40% Weikert, 20% Berks, 10% Bedington, and 30% minor soil types. Both wooded and cleared agricultural lands are located within these associations (Long, 1975; LEAD, 2020). The U.S. Department of Agriculture (USDA) Natural

Resources Conservation Service (NRCS) has mapped eight distinct soil types within the study area (Figure 2-5).

MMF

The MMF consists of six soils listed in Table 2-1, two of which are hydric. Both hydric soils are Brinkerton silt loams. These soils are both found on the outskirts of the LOD to the north and south, where there are streams and/or wetlands that would not be disturbed by the Proposed Action. The Berks and Weikert soil associations typically occur in upland settings derived from residuum.

Voelz Gate ACP

The Voelz Gate ACP LOD mainly contains Berks channery silt loam, 3 to 8 % slopes. The Berks and Weikert soil associations typically occur in upland settings derived from residuum. Approximately 9.1 acres within the LOD is considered hydric and poorly drained, Brinkerton silt loam. None of the soils within the Proposed Action site are considered highly erodible.

***Table 2-2-1: Soils within the Proposed Action Areas***

| **MMF LOD** | | | | | |
|---|---|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in LOD** | **Percent of LOD** | **Hydric** | **Drainage Class** |
| BkB | Berks channery silt loam, 3 to 8 % slopes | 9.2 | 39.7 | No | Well Drained |
| BrA | Brinkerton silt loam, 0 to 3 slopes | 0.4 | 1.9 | Yes | Poorly Drained |
| BrB | Brinkerton silt loam, 3 to 8%slopes | 1.0 | 4.3 | Yes | Poorly Drained |
| WkB | Weikert very channery silt loam, 3% to 8% slopes | 6.7 | 29.1 | No | Somewhat excessively drained |
| WkC | Weikert very channery silt loam, 8% to 15% slopes | 4.4 | 19.1 | No | Somewhat excessively drained |
| WkD | Weikert very channery silt loam, 15% to 25% slopes | 1.4 | 6.0 | No | Somewhat excessively drained |
| **Voelz Gate ACP LOD** | | | | | |
| **Map Unit Symbol** | **Map Unit Name** | **Acres in LOD** | **Percent of LOD** | **Hydric** | **Drainage Class** |
| As | Atkins silt loam | **1.6** | **4.8** | Yes | Poorly drained |
| BkB | Berks channery silt loam, 3% to 8 % slopes | 17.6 | 53.7 | No | Well Drained |
| BrB | Brinkerton silt loam, 3% to 8% slopes | 1.4 | 4.3 | Yes | Poorly drained |
| CtB | Clearbrook channery silt loam, 0 to 8 %t slopes | 0.1 | 0.3 | No | Somewhat poorly drained |
| WeB | Weikert channery silt loam, 3 to 8 % slopes | 7.9 | 24.0 | No | Somewhat excessively drained |
| WkB | Weikert very channery silt loam, 3% to 8% slopes | 4.2 | 12.9 | No | Somewhat excessively drained |

*Source: USDA NRCS, 2025*

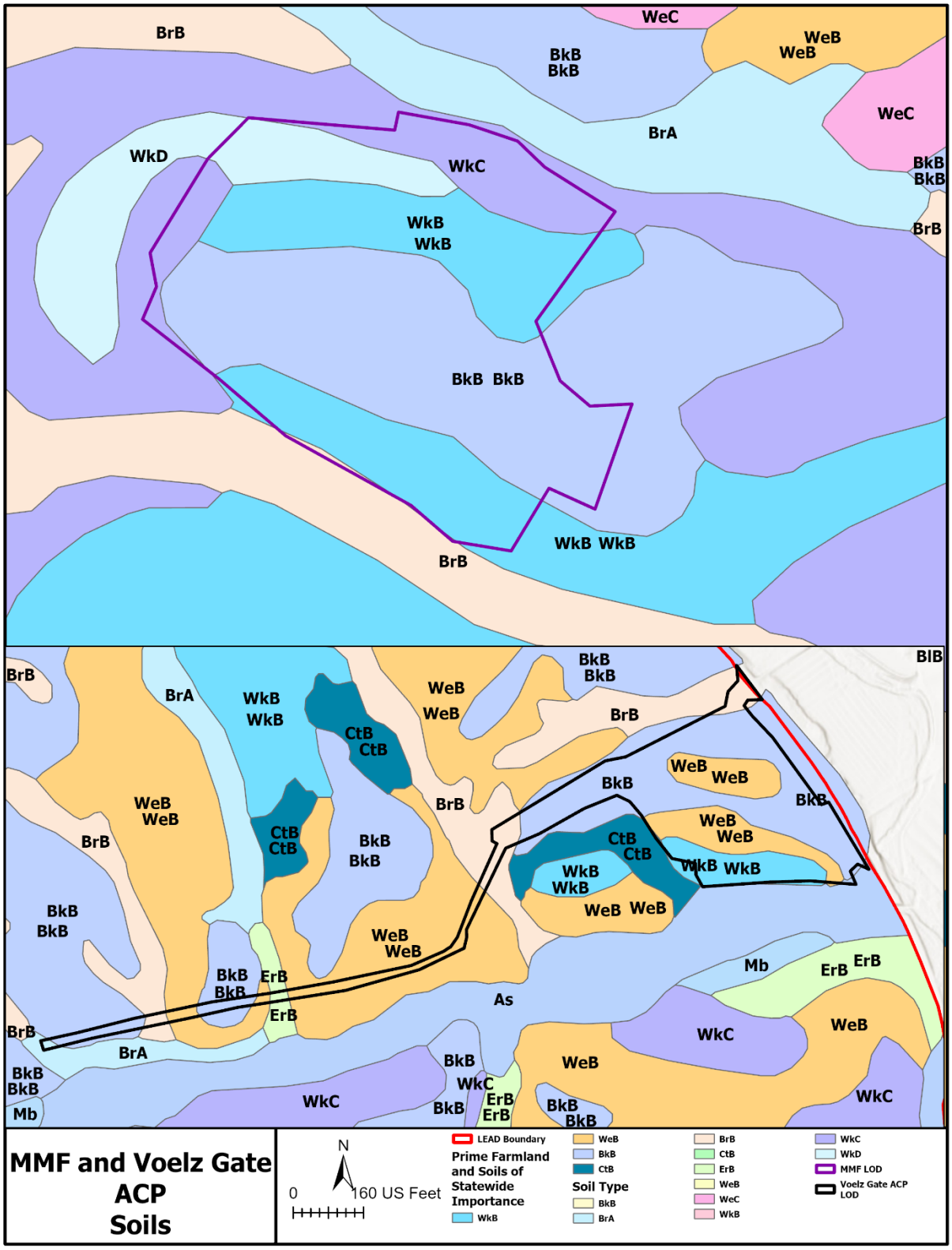


*Figure 2-5: Soils*

## 2.4 Flora and Fauna

The majority of Pennsylvania is covered by Appalachian Oak Forest. The American chestnut (*Castanea dentata*) once dominant throughout much of eastern North America until it was decimated by the chestnut blight (*Cryphonectria parasitica*) in the early 1900s. As the chestnut trees perished, oak species began to proliferate in their place. The Appalachian Oak Forest is chiefly characterized by white oak (*Quercus alba)*, northern red oak (*Q. rubra*), and chestnut oak (*Q. prinus*) , accompanied by a variety of other hardwoods, including scarlet oak (*Q. coccinea*), black birch (*Betula lenta)*, red maple (*Acer rubrum)*, black gum (*Nyssa sylvatica*), hickories (*Carya spp.*), American beech (*Fagus grandifolia*), and tulip tree (*Liriodendron tulipifera*), among others. The understory may feature species such as mountain laurel (*Kalma latifolia*), low sweet blueberry (*Vaccinium angustifolium*), black huckleberry (*Gaylussacia baccata*), witch-hazel (*Hamamelis virginiana),* and more (LEAD, 2020; The Pennsylvania Science Office, 2004). In Pennsylvania, there are 11,702 species of invertebrates documented, with insects comprising the majority at around 46% . The state boasts over 40 fish families, encompassing 225 different species. While the short nose sturgeon (*Acipenser brevirostrum*) is the sole fish species recognized as federally endangered in the state, Pennsylvania acknowledges over 40 fish species as either state threatened, endangered, or potential candidates. The state is home to 36 reptile and 37 amphibian species, with one federally endangered, the bog turtle (*Glyptemys muhlenbergii).* An array of frogs, toads, salamanders, turtles, lizards, and snakes can be found throughout Pennsylvania (LEAD, 2020). A total of 394 wild bird species have been reported in the state, with 186 commonly nesting here. Additionally, the Migratory Bird Treaty Act (MBTA) of 1918, 16 United States Code (U.S.C.) 703–712 protects more than 1,000 species of birds from unauthorized hunting, killing, capturing, selling, or transporting any of the species included on the list. Turkey vultures (*Cathartes aura)* are on the MBTA list and were found to be present within the project APE. Pennsylvania harbors 71 native mammal species, spanning seven orders and 16 families. The Indiana bat (*Myotis sodalis*), Northern long-eared bat (*Myotis septentrionalis),* tricolored bat (*Perimyotis subflavus*) the Delmarva fox squirrel (*Sciurus niger cinereus)* are federally listed endangered species; the tricolored bat is proposed for listing as endangered. The state has successfully reintroduced beavers, elk, and river otters, which were once extinct within its borders (LEAD, 2020).

## 2.5 Paleoenvironmental Conditions

From a regional standpoint, the environmental conditions in Pennsylvania and neighboring regions have experienced moderate fluctuations since the peak of the last ice age, which occurred roughly between 25,000 to 16,000 years ago. During this period, the ice sheet's maximum extent stretched from northwestern Pennsylvania across Ohio, Indiana, and northern Iowa, covering substantial portions of North and South Dakota. It is generally believed that the climate during this time was cooler and more humid compared to the current conditions. As the last glacial maximum drew to a close, around 18,000 to 20,000 years ago, what is now known as Pennsylvania was predominantly covered by coniferous or broadleaved forests characterized by a relatively open canopy. Around 8,000 years ago, the majority of the eastern U.S. had transitioned into dense forests composed of deciduous and mixed tree species. Approximately 5,000 years ago, the vegetation remained quite similar to that of 8,000 years ago. Following this period, the climate gradually shifted toward its present state, marked by heightened moisture levels (LEAD, 2020; USACE, 2023).

## 2.6 Present Land Use and Current Conditions

LEMC occupies the majority of LEAD's land. Its facilities include explosive operating buildings, explosive storage space, igloos, above-ground magazines, rail docks. LEMC's land use includes ammunition storage (Zone 1) and a buffer zone (Zone 2). The ammunition storage area consists of semi-improved and unimproved land. The associated activities include ammunition storage, tactical missile storage & assembly, open burning/open detonation, a firing range, agricultural out leasing, wildlife management, and

recreational hunting and fishing. Included in this area are ESESQD Arcs. ESESQD Arcs are safety buffers intended to protect explosive mission functions from encroaching development while protecting life and property from explosive hazards. Inhabited development, incompatible with explosives operations is prohibited within ESESQD Arcs.

The buffer zone consists of semi-improved and unimproved land. Zone II associated activities include agricultural out leasing, forestry management, wildlife management, and recreational hunting and fishing. LEMC has many acres of agricultural land in the ammunition storage area and buffer area that are leased to area farmers for crop production. LEMC is bordered by agricultural lands to the north and south, the state forest and state game management land to the west, and LEAD cantonment to the east. More than 85% of the land in Franklin County is agriculture or forest. There are several residential developments and a commercial shopping strip along U.S. 11 that service the LEAD and Chambersburg. LEMC is bordered by the Buchanan State Forest to the west and Pennsylvania State Game Lands to the west and south of the Installation. Several farms along the LEMC border are classified as protected agricultural land under the state Agricultural Easement program (LEMC, 2020).

The proposed site for the MMF is currently used as an agricultural field, approximately 23 acres are farmed. The Voelz Gate ACP site is approximately 16 acres of active farmland; however, both sites are categorized entirely as either agricultural tract or agricultural field. (Figure 2-6).

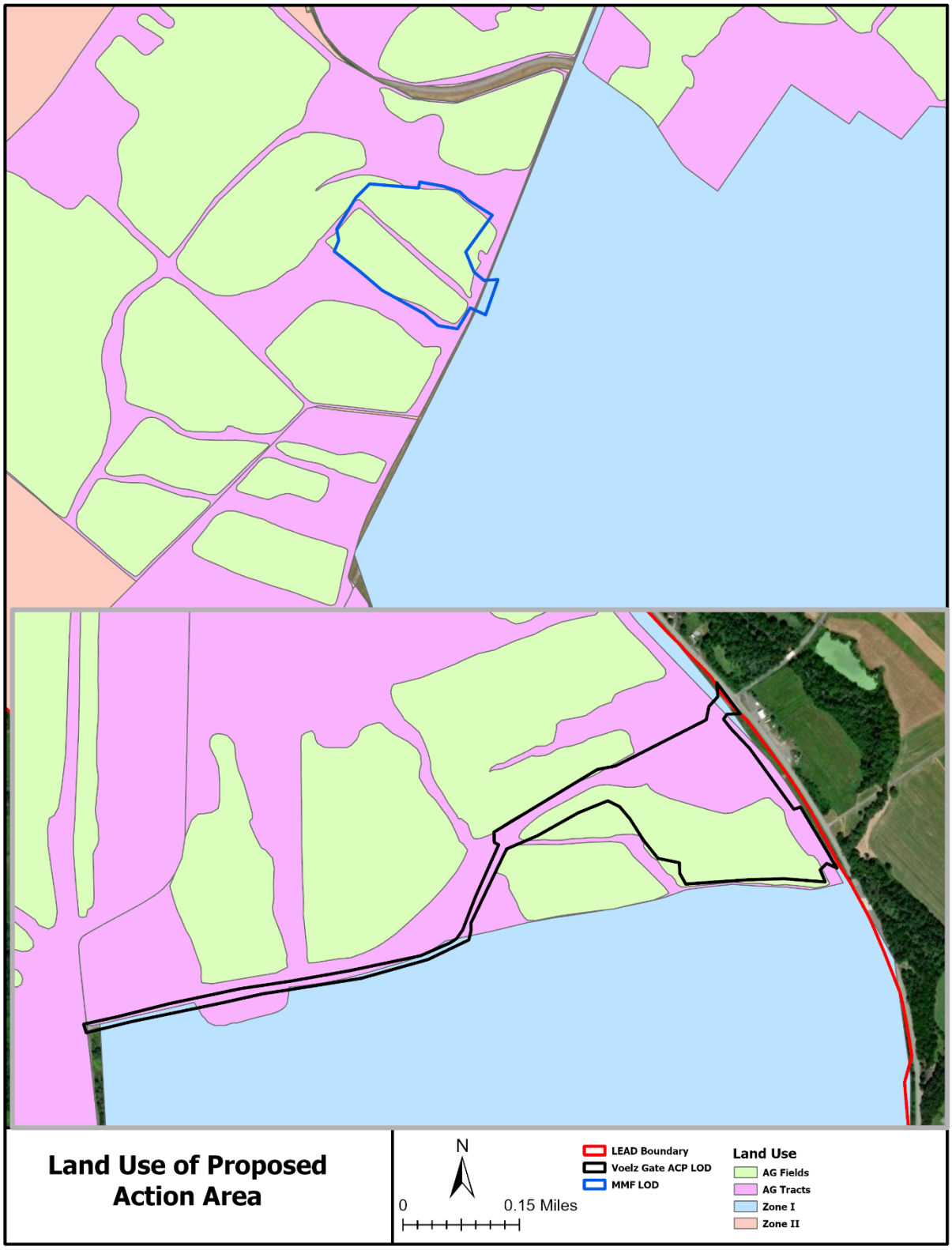


*Figure 2-6: Land Use*

# 3 Cultural Context

## 3.1 Precontact Period

The earliest accepted date of humans settling North America is about 16,000 years ago. While there are some sites that have been dated earlier, it is apparent that human beings were occupying North America by this date. It is also generally accepted that humans first came to North America from Siberia through the Bering Strait. Due to the glacial ice of the Middle and Late Wisconsin age, the sea level was lower than it is today. Geologic evidence indicates that the lower sea level exposed a land bridge between North America and Siberia, which allowed humans to cross. From this point, humans eventually migrated into present-day Pennsylvania. The prehistory of Pennsylvania is divided into six periods: the Paleoindian (circa 14,000-8000 Before Common Era [B.C.E.]), Archaic (circa 8000-1800 B.C.E.), Transitional/Terminal Archaic (circa 1800-1200 B.C.E.), Early and Middle Woodland (circa 1200 B.C.E.-800 Common Ear [C.E.]), Late Woodland/Late Prehistoric (circa 800-1550 C.E.), and Contact (circa 1550-1780 C.E.) (LEAD 2020).

### *3.1.1 Paleoindian Period*

The Paleoindian period extended from circa 14,000-8000 B.C.E. Though the northern portion of the state was covered in ice prior to the Paleoindian occupation, the southern part was covered in open grassland and forests. A handful of sites in North America have yielded very early materials: Meadowcroft Rockshelter in Pennsylvania (14,250 B.C.E.), the Topper Site in South Carolina (14,000 B.C.E.), and Cactus Hill in Virginia (14,200 B.C.E.) (PHMC 2012a). In fact, the Meadowcroft Rockshelter is the earliest known human occupation in North America (Heinz History Center, 2019; LEAD, 2020).

It is generally thought that Paleoindians hunted megafauna but fewer than 100 archeological sites are associated with these now extinct animals, making study and inference problematic (Krech, 2012). Along with smaller animals (perhaps deer, wolf, moose, elk and bison), Paleoindians subsisted on mastodon, mammoth, caribou and moose (Funk, 1972; Funk, 1976). It seems likely that Paleoindians used aquatic resources, nuts, seeds, and berries as well. Based on findings at the Meadowcroft Rock shelter, population density was low (LEAD, 2020).

Around 9500 B.C.E., the fluted point appeared. This is the primary technological remnant of the Paleoindian period. Points found in Pennsylvania are known as “Clovis,” after a type discovered in Southwestern North America. The “flute” refers to a channel running down the middle face of each side of the point for hafting. These large points measure 2.5-10 cm long (Snow, 1980) and are usually made from high quality lithic material (Pennsylvania Historical and Museum Commission, 2012). Other artifacts found in Paleoindian contexts include knives, scrapers, and flake tools. Small, mobile bands moved throughout the area in search of food and resources. Conflict and war were likely rare, as the population was small and did not have to defend territory for natural resources to support their numbers (Pennsylvania Historical and Museum Commission, 2012; LEAD, 2020).

The Shawnee-Minisink Site, situated along the Delaware River in modern day Monroe County, and located approximately 140 miles northeast of LEAD, is a deeply buried Paleoindian site. Tools and two fluted points were recovered, and C-14 dated to 8900 B.C.E. More interestingly, floral remains consisting of blackberry and hawthorn plum, as well as fish bones were found in a hearth. These remains offer a rare glimpse into the Paleoindian diet (Pennsylvania Historical and Museum Commission, 2012a). Located approximately 50 miles northeast of LEAD, the Shoop Site yielded over 100 fluted points. The raw material was a chert found only in New York, some 250 miles away. Many scrapers were also recovered. It has been posited that the site may have been located along a caribou or elk migration path and was used yearly to hunt these animals (Pennsylvania Historical and Museum Commission, 2012a; LEAD, 2020).

### *3.1.2 Archaic Period*

The Archaic period (circa 8000-1800 B.C.E.) showed a gradual transition from the Paleoindian period. The main difference between the Early Archaic and the Paleoindian period is the method of producing stone tools and a less nomadic existence. There is evidence to suggest that hunting megafauna was no longer the main subsistence strategy and bands of people began to move seasonally through a territory (Snow 1980; Funk 1993). The climate had warmed by around 8000 B.C.E. and spruce-pine forests were emerging. Oak, chestnut, and other deciduous trees began to grow in the area but did not replace the spruce-pine forest until around 7000 B.C.E. (Sherfy and Luce, 1998:22; LEAD, 2020).

In the Early Archaic, notched spear points were common and the atlatl, or spear thrower, was in use. Early Archaic people, like the Paleoindians, moved in family or small bands in search of food over a fairly broad area. When the oak and hardwood trees gradually took over the forest by around 7000 B.C.E., a more varied food resource base was available, including nuts, seeds, and more berries. The bifurcated base point is a defining artifact for the Middle Archaic and was common in the southeastern U.S. but is not found much further north than southern New England. This distinctive point style may have offered some hunting advantage in the oak forest. By the Middle Archaic, points were made of locally available raw materials, rather than the high-quality material that was favored in the Paleoindian and Early Archaic times (Pennsylvania Historical and Museum Commission, 2012; LEAD, 2020).

By the beginning of the Late Archaic (around 3000 B.C.E.), population had increased significantly, as evidenced by the increase in the number of known archeological sites and their larger size. The hunting and gathering groups were likely larger, with several related families banding together. The size of the groups likely fluctuated with the seasons, as well. More specialized tools were used to maximize the amount of usable food, as territories shrank. Drills, scrapers, grinding tools, and net sinkers are found in association with Late Archaic sites (Pennsylvania Historical and Museum Commission, 2012b; LEAD, 2020).

### *3.1.3 Transitional Period (1800-1200 B.C.E.)*

Around 2000 B.C.E., there is evidence that the climate was in the middle of a warming and drying trend. As a result, many Transitional sites are found near water sources and appear to have been occupied longer. The trading of stone becomes evident, as does burial ceremonialism. There is little evidence of burial ceremonialism in Pennsylvania, but it is well documented elsewhere in North America (including nearby New York and New Jersey). Broadspears, or long, large, broad blades, are a new type of tool documented in the Transitional period. They may have been used as cutting tools, rather than as spears. The use life of these broadspears is extended by shaping broken blades into scrapers and drills. Another kind of drill, roughly six inches in length and quite thin, is also found and no specific use is known. Stemmed and notched points are also in use, carried over from Middle and Late Archaic times. Fire-cracked rock features are common on the Transitional period sites and suggest food was being cooked for large groups. Steatite, or soapstone, bowls are first found during this time frame. The presence of soapstone, rhyolite, and jasper at locations far from where they naturally occur is evidence of long-distance trading (Pennsylvania Historical and Museum Commission, 2012c; LEAD, 2020).

### *3.1.4 Early and Middle Woodland (circa 1200 B.C.E.-800 C.E.)*

A climate similar to what we know today was in place by roughly 1000 B.C.E. and by around 400 B.C.E., the similarities to the preceding Transitional period had died out: soapstone bowls were replaced by ceramic vessels and tools were again being made from local materials. Hunting and gathering, however, did persist throughout this period. Early pottery was handmade and undecorated and may have been modeled after the soapstone bowls in form. Later, slab and coil construction was used, and cord marking is evidence that the coils and slabs were smoothed together with a paddle wrapped in cordage. As pottery is not easy to transport

long distances due to is fragility, a more sedentary lifestyle is suggested (Pennsylvania Historical and Museum Commission, 2012; LEAD, 2020).

In western Pennsylvania, the Adena culture flourished, and mound building and elaborate burial ceremonialism was practiced. There is also evidence that the Adena gathered seeds (sunflower and chenopodium) to grind into flour and used squash (Pennsylvania Historical and Museum Commission, 2012d). During this time, vast trade and interaction existed in the area, and beyond. Dubbed the Hopewellian Interaction Sphere, this trade of exotic materials originating in the Ohio River Valley at the Hopewell Site and extended into the Pennsylvania area. Exotic materials (grizzly bear and shark teeth, galena, obsidian, mica, marine shell, silver, copper and pipe stone) were exchanged throughout the region and beyond. An increasing degree of ritualism went along with the establishment of this vast trade and interaction network. Monumental earthworks, effigy and burial mounds, and ceremonial centers are associated with the Hopewell. Very few of these Hopewell sites are found in Pennsylvania; in fact, few sites have been documented as Early to Middle Woodland, perhaps because the artifacts "are rather nondescript in appearance, and even their pottery is not distinctive" (Pennsylvania Historical and Museum Commission, 2012d; LEAD, 2020).

### *3.1.5 Late Woodland/Late Prehistoric (800-1550 C.E.)*

Around C.E. 1000, the atlatl was no longer in use and the bow and arrow was the hunting mechanism of choice. Horticulture was practiced in addition to hunting, gathering, and fishing. Sites may have been occupied year-round and pottery styles are finer and more distinctive, so much so, that they can be defined into types by archeologists (LEAD, 2020).

Between C.E. 1000-1300, sites in the Susquehanna River Valley generally contain one to two structures of a size that would house a family. Though this suggests that sites were dispersed and were occupied by only a few families, burial mounds have been documented in the central Susquehanna River Valley and may have required group efforts to manage. Groups of houses are documented after around C.E. 1300 and fortified villages are known by around C.E. 1400. Known as the Shenks Ferry culture, these stockaded villages contained up to 60 houses covering over four acres. Corn, beans, and squash were farmed, and burials have been found throughout but concentrating just outside the houses. By 1550, the Shenks Ferry culture appears to have dissipated or disappeared and the Susquehannock occupied the Lower Susquehanna River Valley. A series of 60-80-foot-long longhouses held as many as 5,000 people (Pennsylvania Historical and Museum Commission, 2012e; LEAD, 2020).

### *3.1.6 Contact Period (1550-1780 C.E.)*

At the time of Contact, there were three distinct groups of Native Americans in Pennsylvania, each occupying one of the three major river valleys: the Delaware occupied the Delaware River Valley; the Susquehannock occupied the Susquehanna River Valley; and the Monongahela occupied the Ohio River Valley. Though not located directly on the Susquehanna River, LEAD is in the Susquehanna River watershed (Pennsylvania Historical and Museum Commission, 2012f; LEAD, 2020).

The stockaded villages of the Susquehannock suggest that unrest and fighting might have existed with neighboring villages. Excavations at the Shultz Site yielded some European artifacts, indicating that the fur trade may have begun in the late 1500s. The Native Americans wanted access to European goods and by the early 1600s the fur trade was in full swing. The Susquehannock began to trade with other Indian groups from Ohio, New York, and Canada and solidified a position as "middlemen", facilitating trade between native populations and the Europeans (Pennsylvania Historical and Museum Commission, 2012). Other Indian groups resented the Susquehannock's position and inter-tribal conflict known as the "Beaver Wars" resulted. But trade with the Europeans continued. In fact:

> "After European contact, the Susquehannocks engaged in extensive trading with the English, Dutch, and Swedes, receiving goods such as glass beads, iron axes, metal harpoons, brass kettles and flintlock muskets. By 1650, much of their natural technology had been replaced by European technology (Pennsylvania Historical and Museum Commission, 2012f)."

As trade continued, so did inter-tribal war, especially between the Susquehannock and the New York Seneca. By 1675, the toll of warfare and European disease had decimated the Susquehannock. What was left of the population moved into Maryland but were eventually invited back by the Seneca, who were worried about other tribes moving into the gap created when the Susquehannock left. In the early 1700s the fledgling colonial government offered them land in Conestoga Township, Lancaster, Pennsylvania, and they became known as the Conestoga Indians. This is generally thought of as the first Indian reservation in Pennsylvania (Pennsylvania Historical and Museum Commission, 2012f; LEAD, 2020).

By the mid-1700s, France and England were both flexing their muscles, attempting to control more and more of North America. The French and Indian War (1754-1763) arose out of this conflict. Native American tribes banded together in their frustration with the Europeans. The French built forts in western Pennsylvania and the British build forts along the Susquehanna River. Most of the fighting took place in the Ohio River Valley in the western portion of the state. Fort Loudon, located in present day Franklin County, was an important supply depot during the conflict (Pennsylvania Historical and Museum Commission, 2012f; LEAD, 2020).

Pontiac's War (1763) was essentially the last Indian attempt to control their fate. The remaining Susquehannock (now known as Conestoga) were attacked at Conestoga and slaughtered, essentially wiping out what remained of this tribe. The remaining Indians were quickly defeated and forced west of the Ohio River in that same year (Pennsylvania Historical and Museum Commission, 2012f; LEAD, 2020).

## 3.2 Historic Period

### *3.2.1 Colonial Period (1681-1776)*

Londoner William Penn embraced the unpopular Quaker, or Society of Friends, religion and sought to convert friends and acquaintances. From a wealthy family, Penn used his money and status to protect fellow Quakers and promote their tenants. King Charles II owed a sum of money to Penn and rather than being repaid, Penn requested a land grant between New York and Maryland. On March 4, 1681, King Charles signed the Charter of Pennsylvania. In April of that year, Penn sent William Markham, his cousin, as deputy governor, to seize control of the territory. Philadelphia was anointed the capitol and the city, and its adjacent counties laid out. Penn stayed for about two years and solidified the Quaker refuge. Quakers were the dominant people in Pennsylvania at that time, though English Anglicans also inhabited the area. Germans settled here too, most commonly in the interior counties and German population increased after 1727. Many Germans immigrated from the Rhineland. Hardships in Ireland led to an influx of Scotch-Irish between 1717 and 1776. Though Quaker sensibilities frowned upon slavery, some 4,000 African American slaves were brought to the area by 1730. By 1790, the African American population numbered around 10,000 (6,500 of which were freed). Smaller numbers of French Huguenot, Jewish, Dutch, and Swedes also resided in Colonial Pennsylvania (Pennsylvania Historical and Museum Commission, 2012g; LEAD, 2020).

Agriculture was an important part of Pennsylvania from the start, most notably in the southeastern portion of the state. Principal crops included corn and wheat, but rye, hemp, and flax were also popular. Of course, river ways were an important early mode of transport. By 1776, roads and stagecoach lines had reached into the south-central portion of the state, originating in Philadelphia. Benjamin Franklin and other inventors, scholars, and thinkers helped seal the reputation of colonial Philadelphia as the "Athens of

America" due to its rich cultural life (Pennsylvania Historical and Museum Commission, 2012g; LEAD, 2020).

### *3.2.2 Revolutionary War to Civil War (Circa 1776-1861)*

The first State Constitution was signed in September of 1776, but many Conservative patriots were opposed to it and fought with the Constitutionalists for years. In 1779, the Conservative governing body signed an act that would remove public lands from the Penn Family control; and in 1780, they signed an act calling for the gradual removal of slavery. By 1789 the Conservatives began to rewrite the state constitution, with both parties willing to give and take (Pennsylvania Historical and Museum Commission, 2012h; LEAD, 2020).

On July 4, 1776, the Declaration of Independence was adopted by the Continental Congress at Independence Hall in Philadelphia. Pennsylvania played an important role in the American Revolution, with Philadelphia serving as the capitol during much of the Revolution. Pennsylvania troops were involved in numerous battles. The importance of Philadelphia was evident to the British, who attacked in 1777 and eventually captured the city. The alliance with France, that had been negotiated by Ben Franklin, coupled with the British defeat at Saratoga, led the British to withdraw from Philadelphia. Pennsylvania farms, factories, and natural resources were important in the eventual success of the Revolution. With no central power, the Articles of Confederation no longer served its purpose, and the Federal Constitutional Congress met in Philadelphia in 1787. Prominent Pennsylvanian, Benjamin Franklin was part of the delegation (LEAD, 2020).

The U.S. Constitution was ratified by the Pennsylvania government in December and by June 21, 1788, it was ratified by nine of the 13 states and went into effect (PHMC, 2012h). The Pennsylvania border was established after disputes with neighboring states, including Connecticut, Delaware, New York, and Virginia. By the 1860s, partially due to generous land grants, population in Pennsylvania had swelled and was distributed throughout the state. By the 1860s, the factory system was in full swing. Textile manufacturing was the most common, along with leather making, lumber processing, shipbuilding, publishing, tobacco processing, and paper manufacture. The iron and steel manufacturing were a boon to the state during these years. Iron ore and coal were also mined with great success (Pennsylvania Historical and Museum Commission, 2012h; LEAD, 2020).

### *3.2.3 Civil War and Industrial Era (1861-1940)*

Though the Quakers had long opposed slavery and slavery had declined significantly in Pennsylvania, it was a major national issue by the eve of the Civil War. Due to its location at the Mason Dixon Line, Pennsylvania served as a border between the North and the South, and its geographic location somewhat protected the North during the conflict. The great iron and steel works were of great importance during the war, as were the Pennsylvania shipbuilding enterprises. Over 350,000 Pennsylvania soldiers were involved in the war effort. Chambersburg, just southeast of the current location of the LEAD, was invaded several times and in fact was burned on July 20, 1864, by Robert E. Lee, leaving many homeless and a wake of damage (LEAD, 2020).

After the war, the state's population began to rise, industrial enterprise continued, and the state government grew. During World War I (1914-1918) mills and factories provided supplies for the troops and the coal and steel industries were at maximum output. Over 324,000 Pennsylvanian men went to war. After the war, the influenza pandemic hit the Philadelphia Naval shipyards, unleashing the spread of the deadly disease in the area. The 1929 stock market collapse, which led to the Great Depression, was the start of tough times in Pennsylvania. With such large industrial workforce, the state suffered and by the end of 1931, 24% of

the state's workforce was out of work. By 1933, the number had reached 37%. Production needs during World War II helped revive the flailing economy (PHMC, 2012i; LEAD, 2020).

### *3.2.4 Letterkenny Army Depot (1941 to present)*

Twelve army ordinance depots were planned in 1941, LEAD being one of them. The site had access to rail lines, was close to water, had human resources available, and was close but not too close to the East Coast and Washington, D.C. The local public decried the loss of prime agricultural land and the displacement of approximately 1,000 people but the bombing of Pearl Harbor, on December 7, 1941, soon changed the tide of public opinion and on December 18 of that same year, the Secretary of War ordered the purchase of 21,000 acres for construction of LEAD. Originally, 798 underground igloos, 12 aboveground magazines, and 17 warehouses were constructed and in 1956, an additional 104 igloos were added. Some existing buildings (farmhouses, barns, chicken houses) were re-purposed and used for LEAD operations. Three million tons of supplies were moved through LEAD during the World War II era (U.S. Army, 2012; LEAD, 2020).

After the war, LEAD was involved in peacetime storage and mission and destroying some of the unusable munitions that were shipped back after the war. At the start of the Korean War in the July of 1950, LEAD added many new employees, sometimes as many as 50 in a day and the work force topped 6,000. In 1953, LEAD began manufacturing missile parts. On July 1, 1954, LEAD became a permanent Army Depot. In 1956, LEAD began "canning" military vehicles in dehumidified storage tanks. This trial was deemed a success when all the vehicles came out in working order (U.S. Army, 2012; LEAD, 2020).

As the Korean War had in the 1950s, the Vietnam Conflict cause work at LEAD to accelerate in the 1960s. With increased demand, more employees were hired. LEAD's Maintenance Division, for example, employed some 1,400 people to recondition artillery, vehicles, and missiles. During the 1960s, the Depot was updated and automated (U.S. Army, 2012; LEAD, 2020).

Relocated from Fort Meade, Maryland in 1964, the 28th Ordnance Detachment was "to dispose of explosive ordnance items such as bombs, shells, rockets, and guided missiles in addition to assisting police in the disposal of explosives and war souvenirs" (U.S. Army, 2012; LEAD, 2020).

In the 1970s, LEAD was less active but still in use: the Northeast Area Flight Detachment moved to LEAD; in 1974, LEAD was slated to store war reserves of petroleum, oil, lubricants, and various chemicals and acids; the Air Tow Missile was maintained here; and in 1976, the U.S. Army Depot System Command was established and headquartered here. By the end of the 1970s, LEAD was Pennsylvania's largest Military Installation, employing some 5,400 people (U.S. Army, 2012; LEAD, 2020).

In the 1980s, LEAD was again updated and modernized and became the largest repair center for HAWK missile system. In addition, LEAD began to work on the Sparrow, a radar guided air-to-air missile and the Improved Sidewinder, an infrared guided air-to-air missile. In the 1980s, LEAD began to comply with the Environmental Protection Agency's effort to clean up contaminated soil and water (U.S. Army, 2012; LEAD, 2020).

The 1990s brought DoD downsizing but LEAD was selected to store and process all items for Operation Good Cause in the invasion of Panama in 1990. In 1992 LEAD was chosen to be the center of all Tactical Missile Systems in the Army, Navy, Air Force, and Marines and completed over 22 missile systems, thus solidifying their reputation as aggressive and efficient. LEAD was the only DoD installation working on the PATRIOT missile system. After the September 11, 2001, terrorist attacks, LEAD began retrofitting vehicles and recapping PATRIOT missiles. LEAD was also updated again and received several awards of excellence during the decade (U.S. Army, 2012; LEAD, 2020).

# 4 Methodology

The goal of the Phase I field survey was to identify archaeological sites in the project area, along with defining their vertical and horizontal boundaries. In accordance with PA SHPO (Pennsylvania State Historic Preservation Office) guidelines (Pennsylvania Historical and Museum Commission, 2021), a surface inspection and walkover was conducted prior to field activity. The APE was examined for any undocumented structures, burials, identified archaeological properties, and/or any land disturbances. This surface inspection and walkover was followed by controlled surface collection, when applicable, and systematically excavated STPs.

Because the APE is currently leased for private agricultural use, LEAD and the field team coordinated the timing of the Phase I survey with planned spring plantings. Based on this coordination, LEAD disked a large portion of the Voelz Gate ACP site; for this area, the survey team completed a controlled surface collection at 12-foot intervals. For this controlled surface collection, artifacts were point plotted. If an artifact was observed during controlled surface collection, adjacent loose dirt was screened in a cruciform pattern at a 5-foot interval of the find to preliminarily define the site boundary. The site boundary was defined by two negative screens at this interval. The remainder of the Voelz Gate ACP site was shovel tested. None of MMF site was available for disking, so the area was systematically shovel tested.

## 4.1 Background and Archival Research

General background and archival research was gathered from a variety of electronic and published resources. Historic cartographic data and historic aerial imagery was reviewed to understand local land use/development patterns. Historic maps and aerial imagery were georeferenced using geographic information systems to assess if resources were potentially present within the APE. Resource forms and survey report information available through the PA SHPO were also reviewed to characterize the known archaeological record.

## 4.2 Historic Maps and Aerial Imagery

A review of available historical United State Geological Survey (USGS) quadrangle maps and aerial imagery was completed to assist in the identification and assessment of potential cultural resources in the MMF and Voelz Gate ACP site areas.

*MMF*

The MMF site appears to have historically consisted of mostly agricultural lands. A map of 1858 Franklin County shows nothing within the MMF site and a northwest-southeast running roadway to the site's south (Figure 4-1). A 1923 USGS topographic map shows a dwelling adjacent to the MMF site's northwest corner and a northwest-southeast running unpaved road cutting through the site's northern end and northeastern portion (Figure 4-2). This dwelling and the unpaved roadway running along the site's northern end can also be seen on 1937 aerial imagery; in early-mid 20th century aerial imagery, agricultural fields are shown throughout the rest of the site area (Figure 4-3). Aerial imagery from 1949 shows the unpaved road and the dwelling as no longer extent with other nearby structures still standing; by this time, the roadway currently known as Massachusetts Avenue ran northeast-southwest within and along the site's eastern boundary (Figure 4-4). By the mid-20th century, the dwelling and unpaved road are no longer visible on historic topographic maps and aerial imagery. A 1966 USGS topographic map and 1970 aerial imagery show nothing within or directly adjacent to the site except for the Massachusetts Avenue roadway along the eastern boundary (Figure 4-5 and Figure 4-6). Historic aerial imagery from the mid-20th century to the present day show the MMF site as predominantly agricultural fields surrounded by wooded areas to the north, east, and south with wood lines dividing the fields in the site's central and southwestern portions and

the Massachusetts Avenue roadway running within and along the site's eastern boundary (NetROnline). Modern topographic maps show nothing within or directly adjacent to the site (Figure 4-7).

*Voelz Gate ACP*

The Voelz Gate ACP site appears to also have historically been comprised of agricultural land. A map of 1858 Franklin County shows a dwelling and roadway within the Voelz Gate ACP site's northeast portion (Figure 4-8). A 1923 USGS topographic map and 1938 aerial imagery show the roadway currently known as North Patrol Road running along the Voelz Gate ACP site's northern and eastern boundaries and a couple of dwellings nearby along that roadway (one directly north of the site and one to its southwest) as well as the central portion of the site area containing agricultural land and Muddy Run to the south (Figure 4-9 and Figure 4-10). By the mid-20th century, the dwellings to the north and southeast on the site are no longer visible on historic topographic maps and aerial imagery; agricultural fields are shown throughout the site area (Figure 4-11 and Figure 4-12). A 1966 USGS topographic map shows nothing within or adjacent to the site except for North Patrol Road along the site's northern and eastern boundaries and the unpaved road as a paved roadway known today as Cumberland Highway immediately east adjacent to and running along the outside of the site's eastern boundary and Muddy Run to the south (Figure 4-13). Historic aerial imagery from the mid-late 20th century show the Voelz Gate ACP as predominantly agricultural fields with the North Patrol Road roadway running within and along the site's northern and eastern boundaries, the Cumberland Highway roadway directly east adjacent to the site's eastern boundary, and Muddy Run to the south (Figure 4-14; NetROnline). By 1994, an unpaved circular roadway connecting to North Patrol Road appears on aerial imagery in the site's northeastern corner (Google Earth Pro). By 2004, the unpaved roadway is no longer visible, and a larger paved expansion of North Patrol Road appears on aerial imagery in the site's northeastern portion and along the site's northern and eastern boundaries with a parking area near the northeastern corner (Google Earth Pro). Between 2017-2019, the parking lot area in the site's northeastern corner was expanded. The Voelz Gate ACP remains visually unchanged on aerial imagery and modern topographic maps from then to the present day (Figure 4-15; NetROnline; Google Earth Pro).

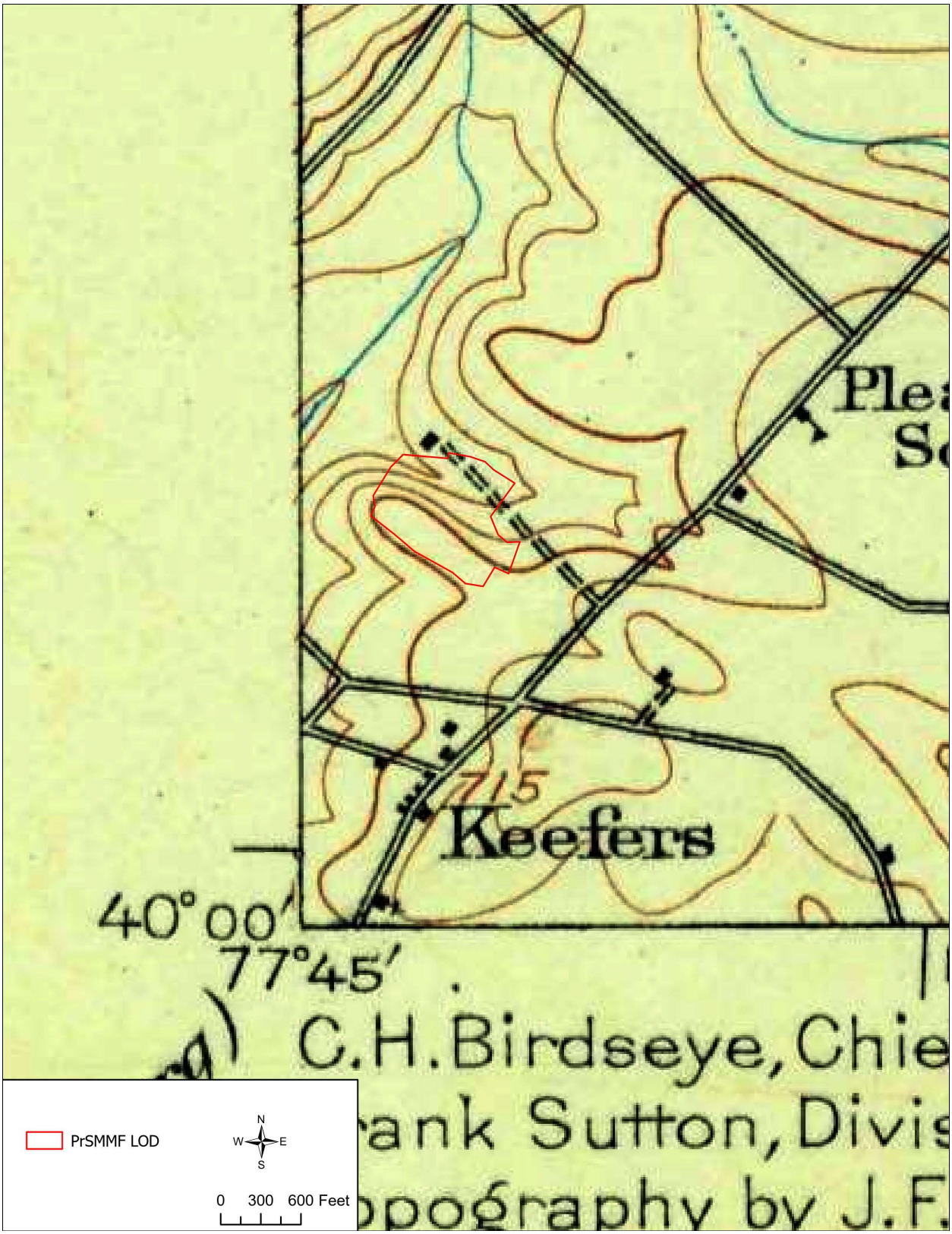


*Figure 4-2: 1923 USGS Topographic Map showing the MMF Site*


***Figure 4-3: 1937 Aerial Imagery showing the MMF Site***


***Figure 4-4: 1949 Aerial Imagery showing the MMF Site***


*Figure 4-6: 1970 Aerial Imagery showing the MMF Site*

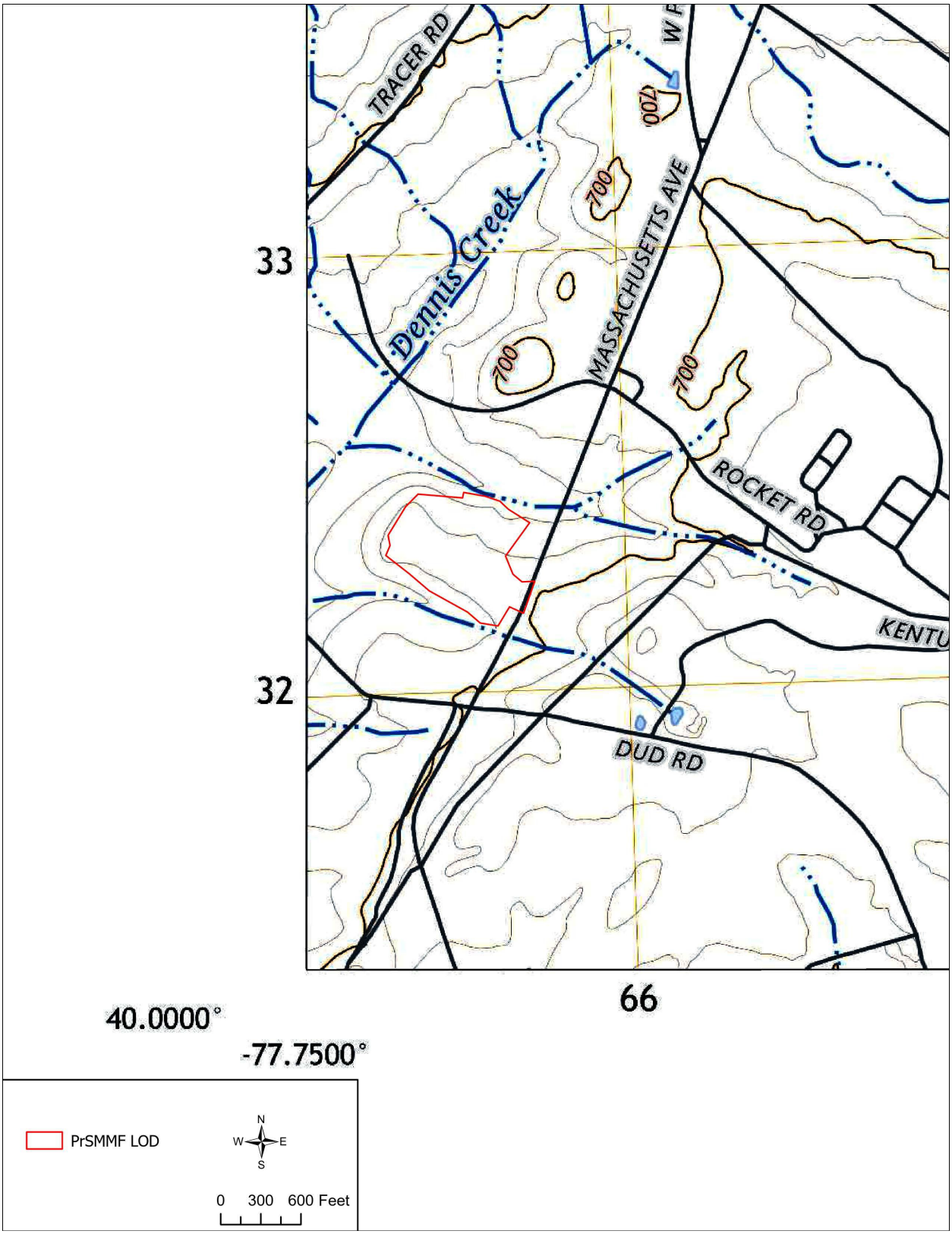


*Figure 4-7: 2023 USGS Topographic Map showing the MMF Site*


*Figure 4-10: 1938 Aerial Imagery showing the Voelz Gate ACP Site*


***Figure 4-11: 1949 Aerial Imagery showing the Voelz Gate ACP Site***


*Figure 4-12: 1957 Aerial Imagery showing the Voelz Gate ACP Site*

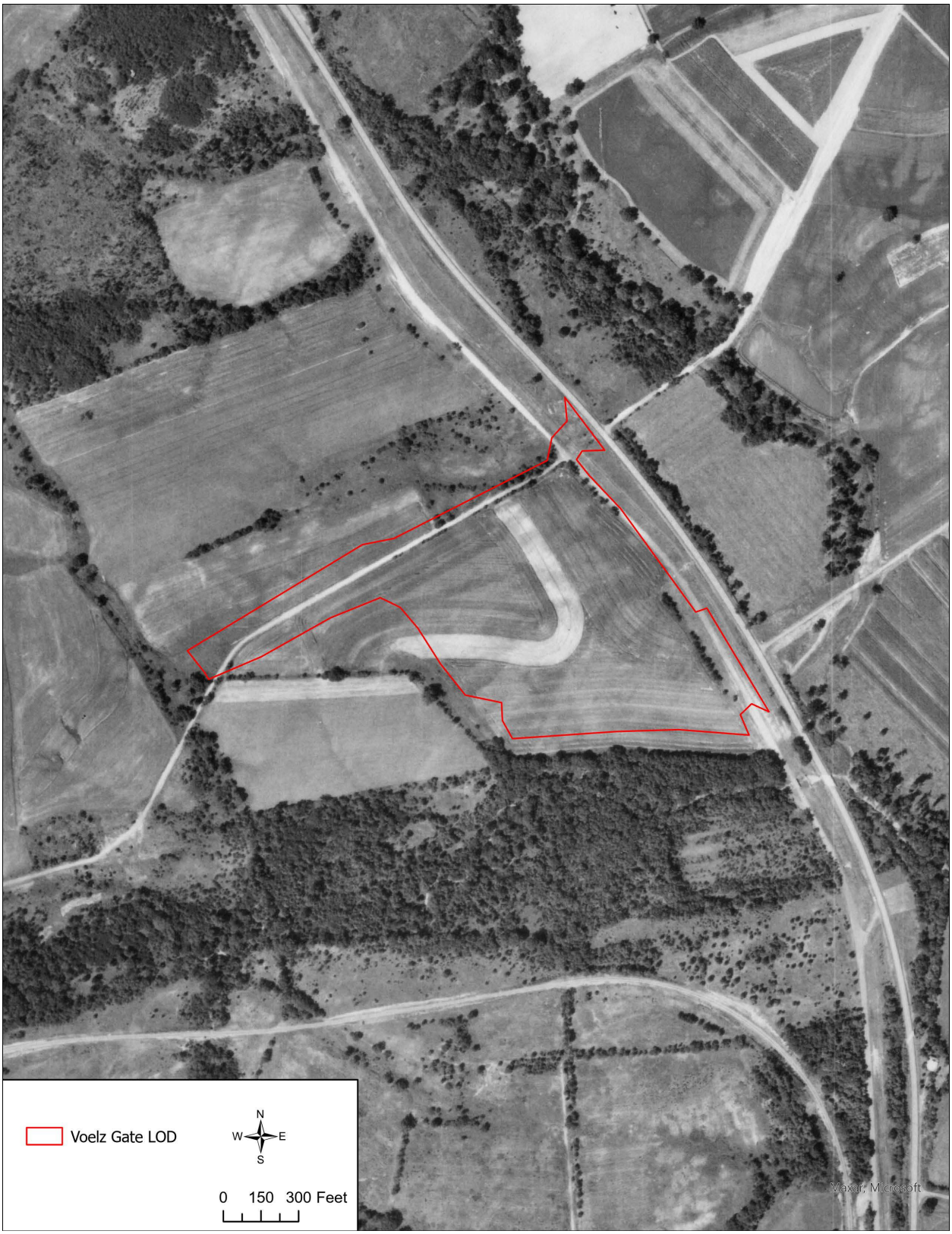


***Figure 4-14: 1970 Aerial Imagery showing the Voelz Gate ACP Site***

## 4.3 Previous Investigations and Cultural Resources

LEAD has no records that either the Voelz Gate ACP or the MMF areas have ever been previously surveyed for archaeological sites, and a review of existing information on Pennsylvania's Historic & Archaeological Resources Exchange PA SHARE does not show any previous archaeological investigations of the LODs. In addition to reviewing LEAD's files and previous survey reports, the PA SHPO's online database, PA SHARE, was carefully reviewed to understand the archaeological context of the area. There are no known individually eligible historic properties identified within the APE. The Rush Hoover House historic archaeological site, 36FR0355, is located along the edge of the Voelz Gate ACP site's northwestern boundary. Other archaeological sites within 1-mile of the Voelz Gate ACP site are located further out from the proposed project area. The Solleberger Farm historic farmstead archaeological site, 36FR0490, was previously determined not eligible and is located south of the Voelz Gate ACP site across Muddy Run. The Muddy Run pre-contact archaeological site, 36FR0412, is southwest of the Voelz Gate ACP site across Cumberland Highway. The pre-contact archaeological site, 36FR0024, is northeast of the Voelz Gate ACP site across Cumberland Highway. Other pre-contact archaeological sites (36FR0017, 36FR0018, and 36FR0019) are located east of 36FR0024, and precontact archaeological site, 36FR0113, is about 0.35 mile west of the Voelz Gate ACP site. The archaeological site 36FR0112 (precontact and historic site) is located to the west of the MMF site. The Isaac Meyers House historic archaeological site, 36FR0341, is located to the southeast of the MMF site. Neither is located within the proposed MMF LOD.

There are 10 known archaeological sites within 1 mile of the MMF and Voelz Gate ACP sites. They are listed below in Table 2.

***Table 4-1: Archaeological Sites within 1 Mile of the Project Areas***

| **MMF** | | |
|---|---|---|
| **Site Number** | **Description** | **NRHP Eligibility** |
| 36FR0112 | Pre-Contact Quarry | Undetermined |
| 36FR0341 | Isaac Meyers House | Undetermined |
| **Voelz Gate ACP** | | |
| **Site Number** | **Description** | **NRHP Eligibility** |
| 36FR0024 | Pre-Contact Open Habitation | Undetermined |
| 36FR0017 | Pre-Contact Open Habitation | Undetermined |
| 36FR0018 | Pre-Contact Open Habitation | Undetermined |
| 36FR0019 | Pre-Contact Open Habitation | Undetermined |
| 36FR0113 | Pre-Contact Open Habitation | Undetermined |
| 36FR0355 | Rush Hoover House | Undetermined |
| 36FR0412 | Muddy Run | Undetermined |
| 36FR0490 | Solleberger Farm | Not Eligible |

## 4.4 Statewide Pre-Contact Probability Model

A Statewide Pre-Contact Probability Model was developed as a joint venture between the PA Department of Transportation and the PA SHPO. Construction of the model consisted of sectioning the state into 10 regions based on Physiographic Zone and watershed, identifying, and building the statistical model(s) by region using pre-contact site locations from the PASS Files, and analyzing relevant environmental factors. The results of this survey were compared to this model to ground truth its accuracy. The state-wide precontact probability model shows the Voelz Gate ACP site encompassing low, moderate, and high probability areas (Figure 4-16) and the MMF site containing low to moderate probability areas (Figure 4-17).

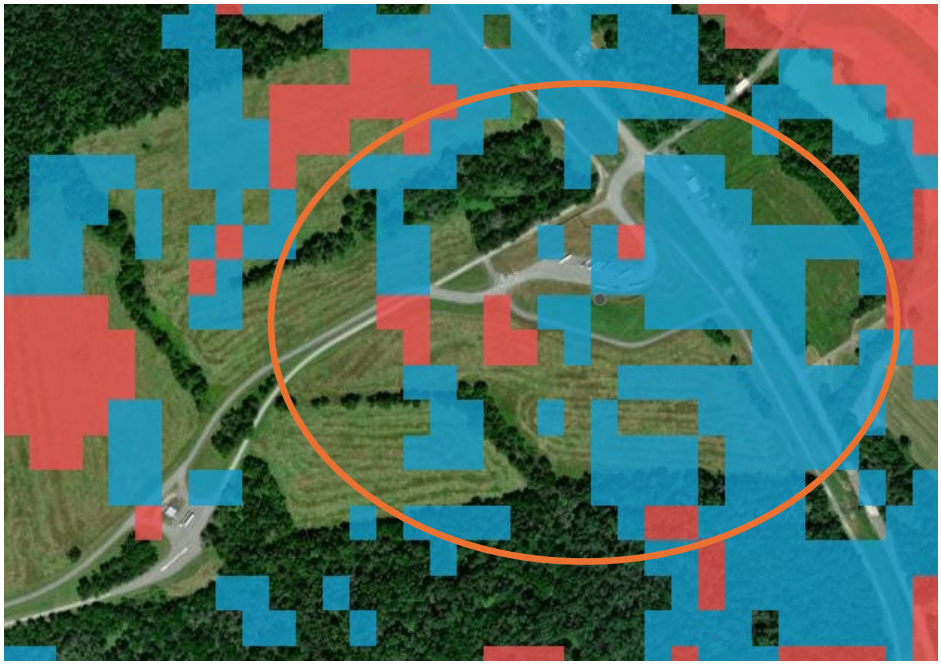

*Figure 4-16: Voelz Gate ACP Site and the Statewide Pre-Contact Probability Model*

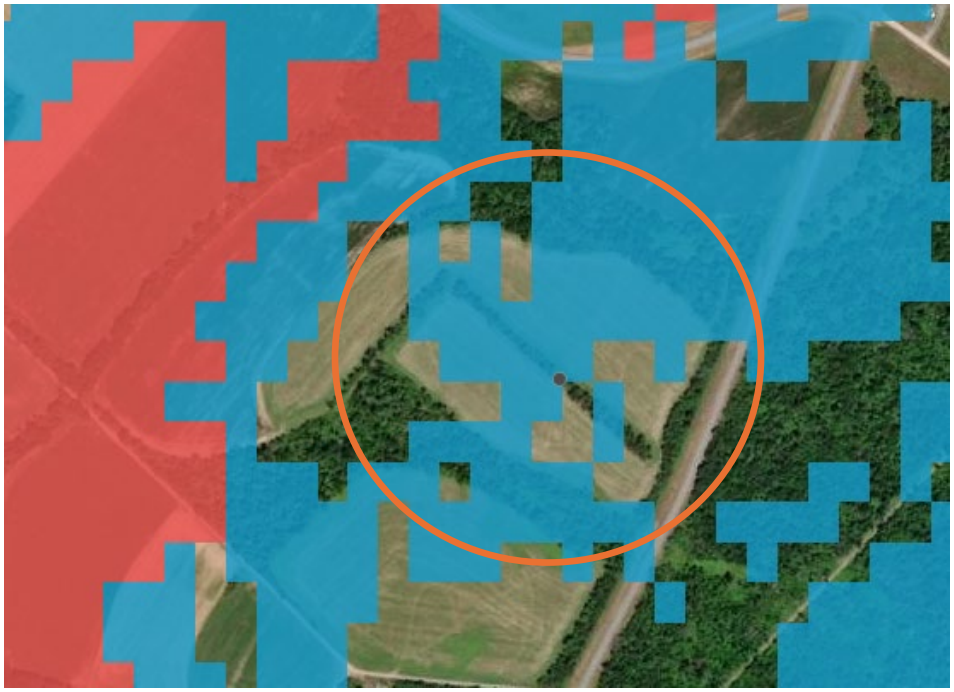

*Figure 4-17: MMF Site and the Statewide Pre-Contact Probability Model*

## 4.5 Shovel Testing and Field Methods

All excavated soils were screened through ¼ inch hardware mesh and excavation extended to a depth at which no archaeological materials could be found or at which the vertical APE has been investigated to the point where the project impacts would not affect any deeper archaeological deposits. STPs were excavated at a 50-foot interval on a grid system in areas that have not been previously plowed or where plowing is not practicable. STPs were hand excavated in 1.87-foot diameter circular pits and did not extend deeper than 3.28-foot.

STPs extended at least 0.33-foot into the subsoil (B Horizon). All STPs were excavated in natural stratigraphic levels. If archaeological resources were identified during shovel testing, additional shovel tests (radials) were excavated in a cruciform pattern within the original testing grid to preliminarily define the site boundary. Radials were excavated at a 5-foot interval with the site boundary defined by two negative tests at this interval.

STPs for areas previously plowed and within low and moderate probability areas were excavated at wider 100-foot intervals. If archaeological resources were identified during shovel testing, additional shovel tests (radials) were excavated in a cruciform pattern within the original testing grid to preliminarily define the site boundary. Radials were excavated at a 50-foot interval with the site boundary defined by two negative tests at this interval.

All observed artifacts were collected. Modern materials, such as plastic waste, were noted in the field, but not collected. For any artifacts recovered and analyzed during the survey, the following information was collected:

1) The tabulation of all artifacts by provenience, stratum (or arbitrary level), and feature
2) Artifact material
3) Artifact functional type
4) Total artifact count by site
5) Total artifact counts and percentages by functional and material categories
6) Total artifact count by frequency per unit area or volume
7) Diagnostic artifact identification specifying cultural/chronological types, if known.

Photographs of all diagnostic points and sample historic diagnostic artifacts are also included in this report.

## 4.6 Laboratory Methods

The project included washing, cataloguing, and analyzing any recovered artifacts from the archaeological survey using standard methods and approaches used for other USACE projects and as recommended by the PA SHPO. Recovered artifacts were transferred by USACE to LEAD for curation.

After cleaning and through drying, all artifacts were re-bagged in 4-mil polyethylene zippered bags and labeled with acid-free tags. Diagnostic artifacts were photographed. Artifacts were analyzed to identify material type, function, and class, date of manufacture, and any other diagnostic characteristics. Sources consulted to aid artifact identification and dating included glass bottle manufacturing and identification books, ceramic manufacturing and identification books, and comparative museum collections. Horizontal and vertical artifact distributions were analyzed to identify and interpret any potential site occupation, use, and abandonment.

# 5 Results

Field archaeologists conducted STP sampling, pedestrian survey, and controlled surface collection for the project from 14 April 2025 through 22 April 2025.

## 5.1 Pedestrian Survey

*Voelz Gate ACP*
USACE staff first conducted a pedestrian survey of the Voelz Gate ACP and MMF sites. Within the Voelz Gate ACP site, field staff observed utilities running along the northeastern and easternmost portions, including powerline corridors, stormwater drainage, and water lines. An asphalt parking lot is also within the northeastern portion of the project area with berms and other noticeably moved earth around the parking lot's fence line. Gravel roadways run through the project area's northeastern portion and along its eastern boundary. Asphalt roadways run along the project area's northwestern boundary. The areas with the most disturbances were within the project area's northeastern portion around the parking lot and roadways. It was determined that judgmentally selective STPs would be excavated in these areas previously disturbed by modern activity with low probability for containing archaeological resources. The majority of the project area's southern half contains open agricultural field and, as an area that is annually cultivated, it was recommended for controlled surface collection.

The MMF site is mostly bounded by tree lines with a tree line running northwest-southeast through the center of the project area. On pedestrian survey, field staff observed the project area's predominately open and sloping agricultural fields and the woods within and along the project area's tree lines. Because disking the project area's annually cultivated agricultural fields was not possible, the project area was shovel tested.

## 5.2 Controlled Surface Collection

As previously noted, only the Voelz Gate ACP site was subject to controlled surface collection. Most of the southern portion of Voelz Gate ACP contains open agricultural field. A portion of that field was disked by LEAD on 16 April 2025 ahead of controlled surface collection efforts conducted later that day; the other southernmost portion of the Voelz Gate ACP field was systematically shovel tested. Field staff conducted the controlled surface collection of the disked area at 12-foot intervals. For this controlled surface collection, artifacts were point plotted. When an artifact was found, adjacent loose dirt was screened in a cruciform pattern at a 5-foot interval to act as radial testing and help define a possible site boundary. As a result of this controlled surface collection, three artifacts were recovered. Surface Find 1 (SF1) was a small porcelain fragment, SF1 Radial 4 (SF1R4) (5 feet south of SF1) was a small brick fragment, and SF2 was a small whiteware fragment. These three artifacts were determined to be isolated finds and not constitute a site.

## 5.3 Shovel Test Survey

*Voelz Gate ACP*
Since it was unavailable for disking, the southeasternmost portion of the Voelz Gate ACP site that contains annually cultivated agricultural field was systematically shovel tested at 50-foot intervals. A total of 107 STPs were excavated in this area.

Due to previous modern ground disturbance from utilities and past construction of the parking lot and roadways, the Voelz Gate ACP site's northeastern portion and western edge were surveyed using judgmentally selective STPs. Twenty-two STPs were excavated in this area.

The areas of modern ground disturbance within the project area's northeastern and easternmost portions had bluestone gravel mixed into disturbed soils. Except within the areas of modern ground disturbance,

primarily within the project area's northeastern and easternmost portions, results of the survey demonstrated mostly intact soil stratigraphy within the Voelz Gate ACP site's agricultural fields, confirming their regular cultivation and farming activity. The typical soil profile consisted of two strata (Figure 5-1). Stratum I was the Ap horizon ranging from 0.7 to 1.1 feet thick. The soil texture was silt loam, and the soil color was a 10YR 4/4 dark yellowish brown flecked with 10YR 5/6 yellowish brown. The soil structure of Stratum I was granular in nature, easily screened, and contained about 0-5% channers. Stratum II, the B horizon, was encountered around 0.7 to 1.1 feet deep and consisted of silt loam. The soil structure of Stratum II was granular in nature with 0-15% channers. The soil color of the B horizon was a 10YR 5/6 yellowish brown.

Of the 129 STPs excavated within the Voelz Gate ACP site, none were positive for cultural materials (Figure 5-2). One piece of modern ceramic (terracotta from a planting pot) found in STP 5 was discarded in the field.

***Figure 5-1: Voelz Gate, Representative STP***

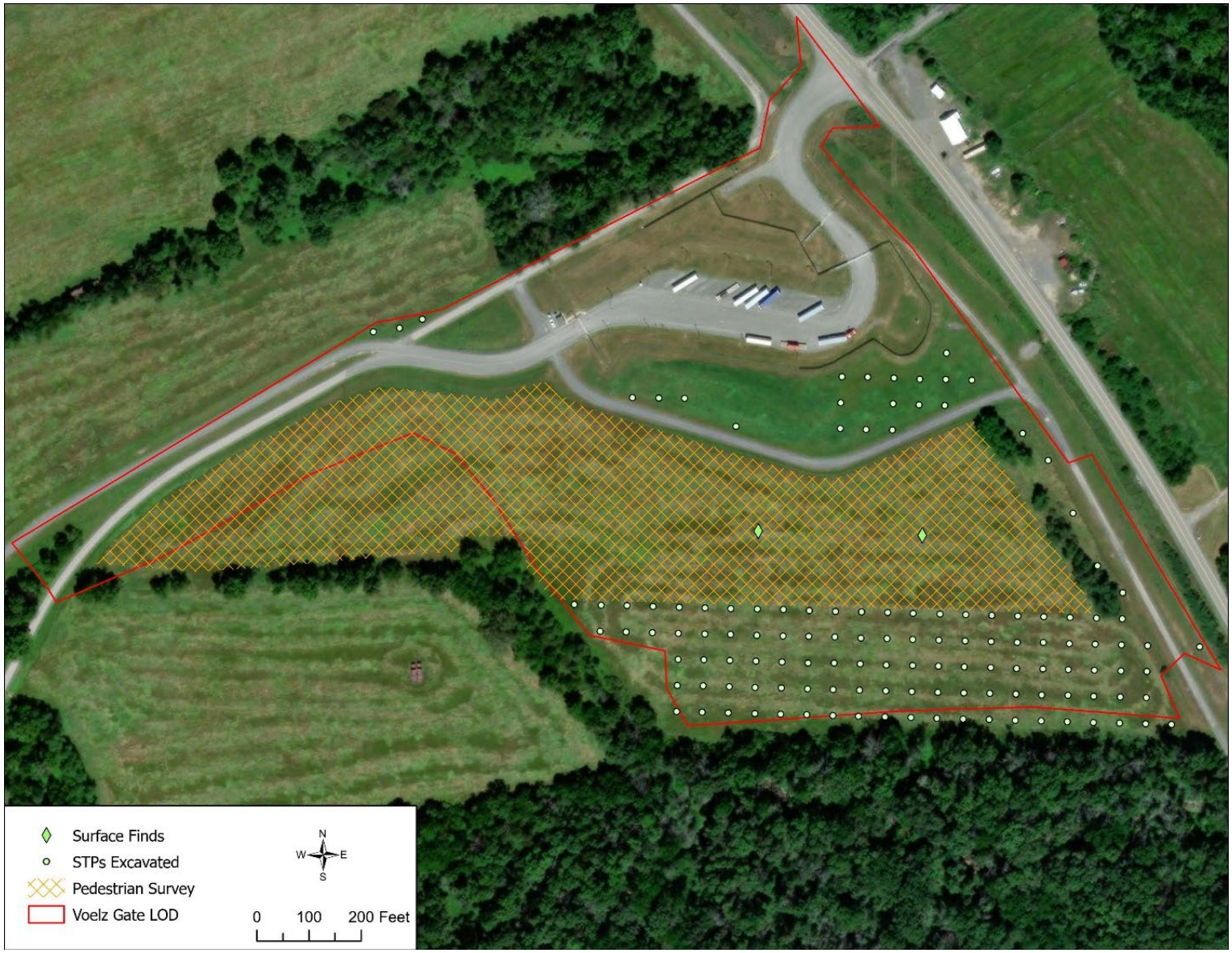


***Figure 5-2: Voelz Gate ACHP Site, Phase I Archaeological Survey***

*MMF*

As previously noted, the majority of the MMF site contains annually cultivated agricultural fields within low to moderate probability areas. Systematic shovel testing began at 50-foot intervals in the project area's northwestern corner. As shovel testing confirmed the area's past cultivation and low to moderate probability for archaeological resources, STP intervals were widened to 100-foot intervals for the remainder of the project area. A total of 80 STPs were excavated at the MMF site.

Results of the survey demonstrated mostly intact soil stratigraphy within the MMF site, reflective of its regular cultivation and farming activity. The typical soil profile consisted of two strata (Figure 5-3). Stratum I was the Ap horizon ranging from 0.6 to 0.8 feet thick. The soil texture was silt loam, and the soil color was a 10YR 3/4 dark yellowish brown. The soil structure of Stratum I was granular in nature and easily screened and contained about 0-5% channers. Stratum II, the B horizon, was encountered around 0.6 to 0.8 feet deep and consisted of silt loam. The soil structure of Stratum III was granular in nature with 10-15% channers. The soil color of the B horizon was a 10YR 5/6 yellowish brown.

Of the 80 STPs excavated within the MMF site, only one tested positive for cultural materials (Figure 5-4 and Figure 5-5). STP 103 contained a partial lithic identified as a Brewerton Corner-Notched. One piece of modern window glass found at STP 38 was discarded in the field.

***Figure 5-3: MMF, Representative STP***

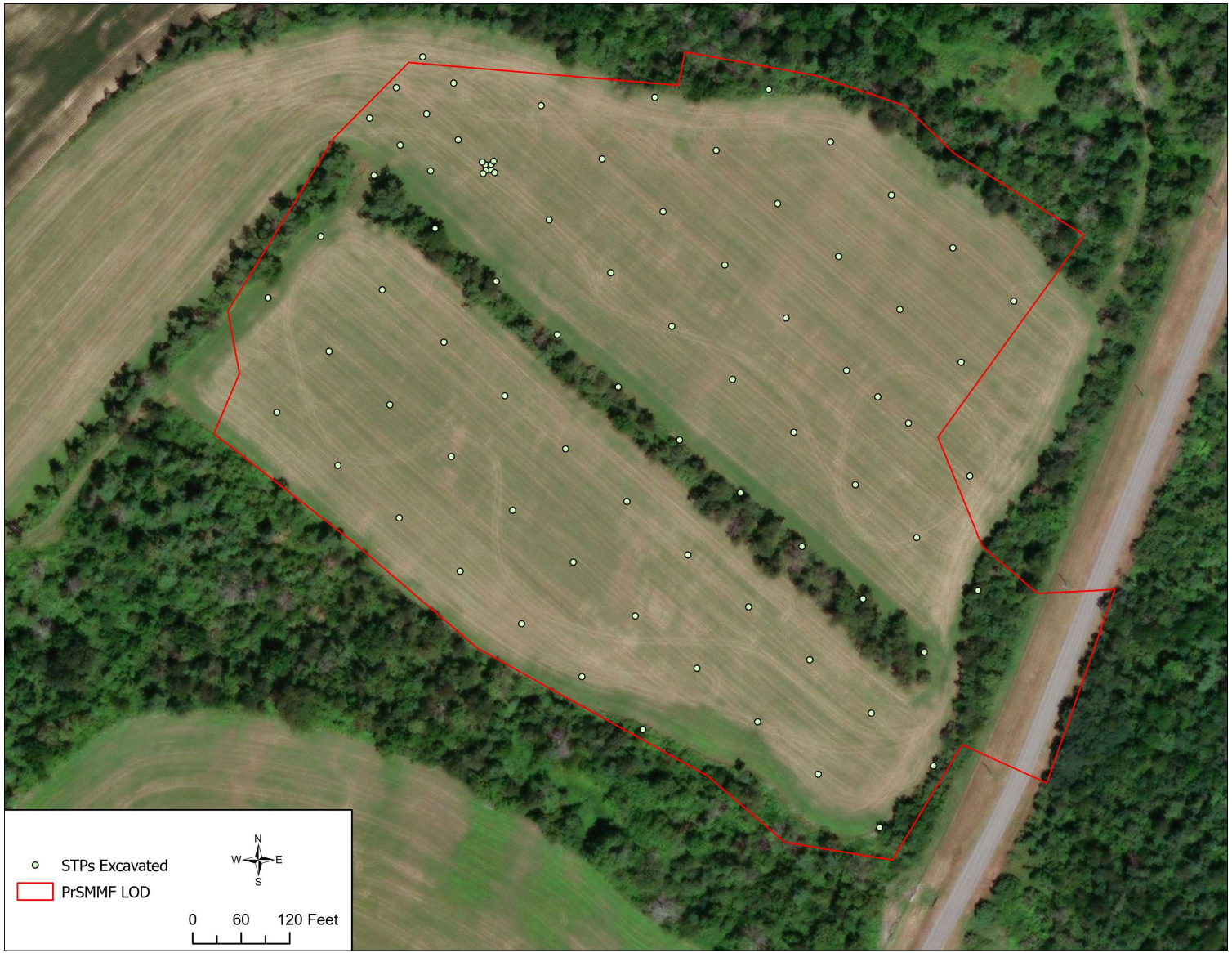


***Figure 5-4: MMF Site, Phase I Archaeological Survey***

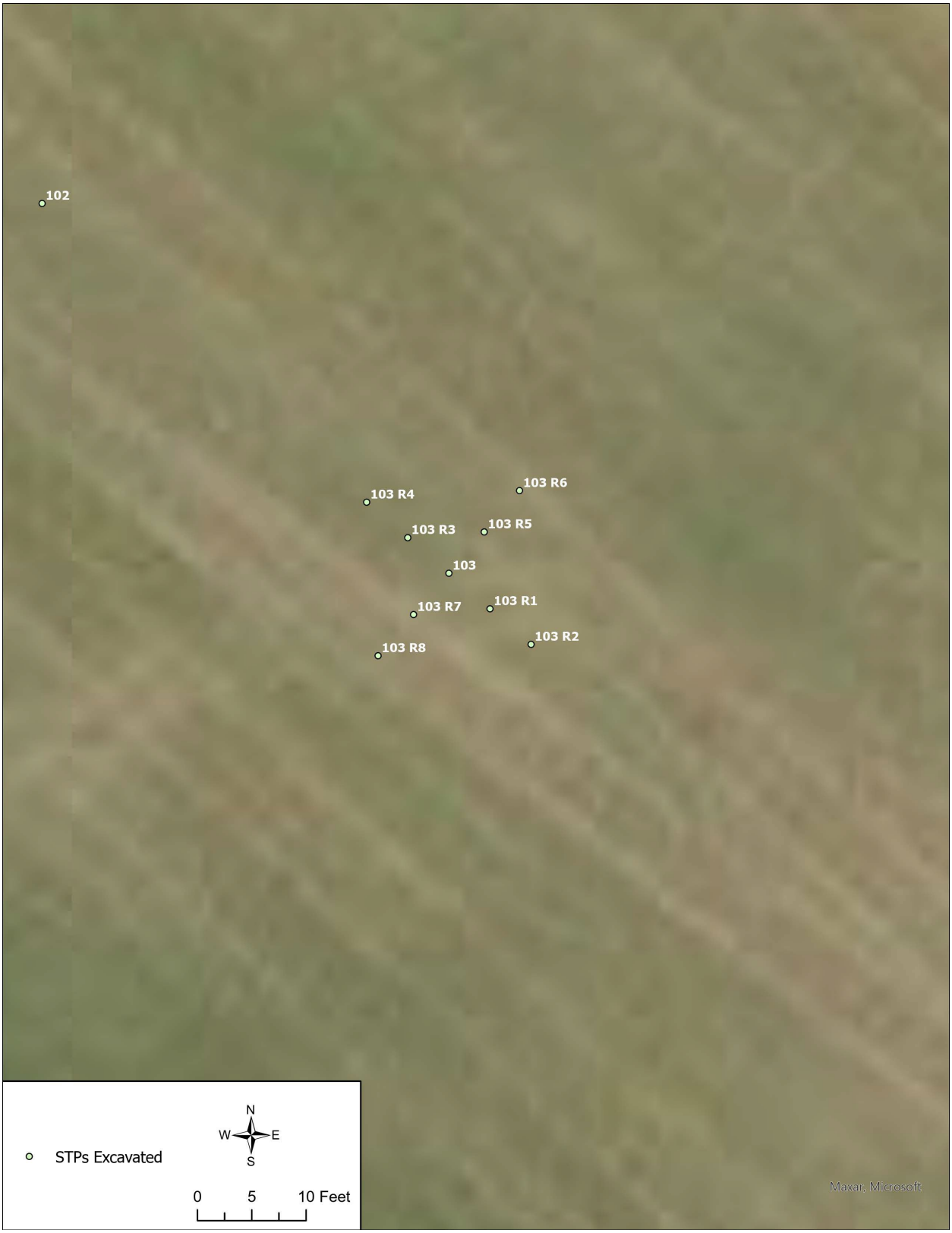


***Figure 5-5: MMF Site, Phase I Archaeological Survey, STP 103 Radials***

## 5.4 Isolated Finds

Four isolated finds were recovered during this survey. These isolated finds were primarily found during controlled surface collection of the Voelz Gate ACP site: SF1, SF1R4, and SF2. The only other find was a lithic recovered from STP 103 at the MMF site.

*SF1*
This isolate was recovered on the surface during controlled surface collection of the Voelz Gate ACP site field after it was disked. Four radial screenings of adjacent loose dirt 5-feet from the find were conducted around it; only one was positive, SF1R4. The ceramic was identified as a small porcelain fragment (Figure 5-6).


***Figure 5-6: Voelz Gate ACP, Surface Find 1, Porcelain Fragment***

*SF1R4*
This isolate was encountered on the surface during controlled surface collection of the Voelz Gate ACP site field after it was disked, approximately 5 feet south of SF1. The artifact was identified as a small brick fragment (Figure 5-7).


***Figure 5-7: Voelz Gate ACP, Surface Find 1, Radial 4, Brick Fragment***

*SF2*

This isolate was recovered on the surface during controlled surface collection of the Voelz Gate ACP site field after it was disked. Four radial screenings of adjacent loose dirt 5-feet from the find were conducted around it and all yielded negative results. The ceramic was identified as a small whiteware fragment (Figure 5-8).

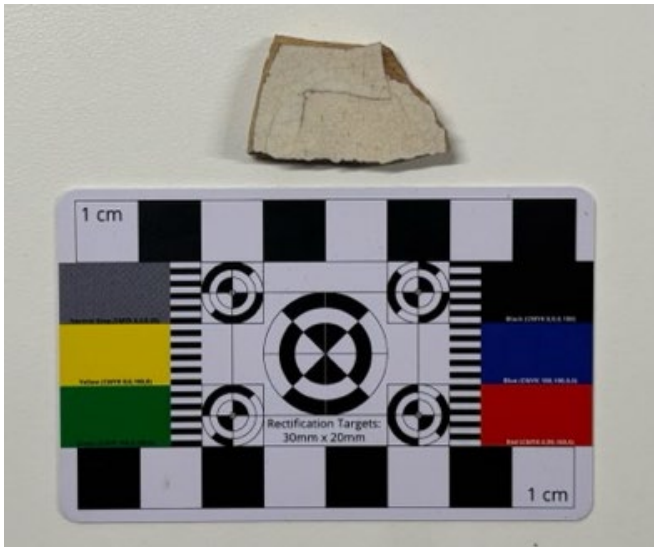


***Figure 5-8: Voelz Gate ACP, Surface Find 2, Whiteware Fragment***

*STP 103*

This isolated lithic was discovered in STP 103, in the northwestern portion of the project area and approximately 900 feet northwest of Massachusetts Avenue. Radials were excavated north, south, east, and west of STP 103, and all of them were negative for cultural materials. This partial lithic was identified as part of a rhyolite Brewerton Corner-Notched point (Figure 5-9).


***Figure 5-9: MMF, STP 103, Partial Lithic (Brewerton Corner-Notched)***

# 6 Discussion

The results of the Phase I archaeological investigation of the Voelz Gate ACP and MMF sites are discussed below.

## 6.1 Statewide Pre-Contact Probability Model Comparison

The results of the archaeological survey were compared to the results predicted by the Statewide Pre-Contact Probability Model. According to the model, the Voelz Gate ACP and MMF sites had predominantly a low to moderate probability of containing pre-contact archaeological sites. Generally, the results of archaeological testing at both sites support the model prediction. The survey did not encounter any pre-contact finds or features at the Voelz Gate ACP site, and only one isolated diagnostic pre-contact artifact (the Brewerton Corner-Notched point) was found within a moderate sensitivity area at the MMF site. Although the model predicted a higher probability of pre-contact finds at the Voelz Gate ACP site than the MMF site, the model does not account for ground disturbance from construction of modern features (parking lot, roadways, utilities, etc.) within the Voelz Gate ACP site. Completed testing methodology matrices for each site are shown in Table 6-1 and Table 6-2.

***Table 6-1: Voelz Gate ACP Completed Testing Methodology Matrix***

| Sensitivity Tier | Area within this Tier in Square Meters | Percent of the Total Project Area | Methods Used to test this tier | Number of Sites Located |
|---|---|---|---|---|
| High | 8,400 square meters | 11% | Pedestrian Survey, Shoveling Testing | 0 |
| Moderate | 34,000 square meters | 47% | Pedestrian Survey, Shoveling Testing | 0 |
| Low | 30,443 square meters | 42% | Pedestrian Survey, Shoveling Testing | 0 |

***Table 6-2: MMF Completed Testing Methodology Matrix***

| Sensitivity Tier | Area within this Tier in Square Meters | Percent of the Total Project Area | Methods Used to test this tier | Number of Sites Located |
|---|---|---|---|---|
| High | 0 square meters | 0% | Not applicable | 0 |
| Moderate | 43,000 square meters | 33% | Pedestrian Survey, Shoveling Testing | Diagnostic Isolated Find - STP 103 |
| Low | 86,499 square meters | 67% | Pedestrian Survey, Shoveling Testing | 0 |

## 6.2 NRHP Eligibility

Per 36 CFR 800, federal agencies are required to consider the effects of federal undertakings on historic properties and take necessary actions to ensure the protection of historic properties. Regulation 36 CFR 800, *Protection of Historic Properties*, sets forth the compliance requirements to identify, evaluate and determine the effects of federal undertakings on historic properties (i.e., the Section 106 process). LEAD has proposed undertakings related demolition and new construction at its Voelz Gate ACP and MMF facilities. To support compliance activities related to the proposed undertakings, LEAD seeks to identify and evaluate both sites for archaeological resources that may qualify as historic properties.

The term “historic property” is defined in the NHPA as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register.” Historic properties include artifacts, records, and remains that are related to a district, site, building, structure, or object (16 USC 470[5]). To be considered a “historic property,” cultural resources must be evaluated as meeting the significance criteria for listing on the NRHP. The NRHP eligibility of an archaeological site is typically evaluated under Criterion D, which qualifies a cultural resource for listing on the NRHP for its ability to yield significant information (36 CFR 60.4).

The isolated finds from the Voelz Gate ACP and MMF sites are recommended not eligible for the NRHP. All finds were recovered from plow zone contexts of annually cultivated agricultural fields that have been stripped by farming activities. None of the isolated finds indicate the presence of an archaeological site that would add new information or address substantial research questions that would meet Criterion D.

Furthermore, the isolated finds do not meet the definition of an archaeological site under PA SHPO standards (PHMC, 2021). The Voelz Gate ACP site’s isolated finds, which consist of three historic artifacts (two ceramic fragments and a brick fragment), were recovered from a currently plowed field; historic maps do not indicate the presence of past historic resources in this area. The minimum standards for a historic site within a currently plowed context, in the absence of map evidence, requires the presence of 50 artifacts within a one-acre or smaller area. Therefore, due to its low artifact density, the Voelz Gate ACP site does not constitute a historic archaeological site. The MMF site also exhibited a low artifact density. At MMF, there was one isolated diagnostic pre-contact artifact (the Brewerton Corner-Notched point) recovered from an agricultural field; no more than one pre-contact artifact was recovered, and no subsurface features were present. The minimum standards for a pre-contact site include two or more culturally modified objects and/or the presence of any subsurface culturally derived feature. Therefore, the isolated find at MMF does not constitute a pre-contact archaeological site.

# 7 Summary and Recommendations

In accordance with Section 106 of the NHPA of 1966, as amended, and its implementing regulations at 36 CFR Part 800, a Phase I archaeological investigation was conducted at the Voelz Gate ACP and MMF sites to identify the presence of archaeological resources within the APE for the proposed undertakings. The proposed project includes new construction and operation of MMF and Voelz Gate ACP as well as the demolition of the existing Voelz Gate ACP once the new ACP is operational. A surface inspection and walkover was conducted prior to field activity. A total of 120 STPs were excavated within the Voelz Gate ACP site, and 80 STPs were excavated within the MMF site. A large portion of the Voelz Gate ACP containing agricultural fields was subject to controlled surface collection after recent disking. The survey did not identify the presence of archaeological features. Archaeological investigation yielded a total of four isolated artifacts. Furthermore, construction of the existing Voelz Gate ACP site (including its roadways, parking lot, and utilities) has disturbed much of its northeastern area. Both the Voelz Gate ACP and MMF sites have annually cultivated agricultural fields that have been stripped by farming activities. Given the lack of archaeological evidence and patterning, and previous disturbance, USACE recommends that the proposed undertakings will have no effect on archaeological resources. Based on the results of the Phase I archaeological investigation, no further archaeological work is recommended.

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**Appendix A – Artifact Catalog**

Voelz Gate ACP
Surface Find 1
Porcelain fragment: 1

Surface Find 1, Radial 4
Brick fragment: 1

Surface Find 2:
Whiteware fragment: 1

MMF
STP 103
Partial lithic (Brewerton Corner-Notched): 1

**Appendix B – Shovel Test Pit Data**

*Voelz Gate ACP Site*

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 1 | 1.3 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown ,silt loam, gravelly<br>0.7-1.3 ft: 10YR 5/6 yellowish brown, silt loam, gravelly |
| 2 | 1.0 | Negative | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.6-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 3 | 1.3 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam, friable<br>0.3-1.3 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 4 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 5 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 6 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 7 | 1.6 | Negative | 0-1.1 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.1-1.6 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 8 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 9 | | Negative | Disturbed, on top of manmade berm adjacent to gravel road |
| 10 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 11 | 0.9 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-0.9 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 12 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 13 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 14 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 15 | 1.2 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.7-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 16 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 17 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.8-1.1ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 18 | 1.3 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.9-1.3ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 19 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 20 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 21 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 22 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 23 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 24 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 25 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 26 | 1.5 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>1.0-1.5 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 27 | 1.0 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 28 | 1.3 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.9-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 29 | 1.0 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 30 | 1.5 | Negative | 0-1.2 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.2-1.5 ft: 10YR 5/6 yellowish brown, silt loam |
| 31 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| | | | 0.9-1.2ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 32 | 1.1 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 33 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 5% channers |
| 34 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 5% channers |
| 35 | 0.8 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-0.8 ft: 10YR 5/4 yellowish brown, wet with some gleying |
| 36 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 5% channers |
| 37 | 1.4 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.4 ft: 10YR 5/6 yellowish brown, silt loam |
| 38 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 39 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 40 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 41 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 43 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 44 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 45 | 0.7 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-0.7 ft: 10YR 4/6 yellowish brown, silt loam, mixed with 7.5YR 6/8 reddish brown and some construction gravel |
| 46 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 46 | 1.2 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 47 | 1.2 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, mixed with gravel from gravel roadway<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 48 | 1.2 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 49 | 0.8 | Negative | 0-0. 8ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>Terminated after hitting a water table and STP became inundated |
| 50 | 0.6 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-0.6 ft: 10YR 4/6 yellowish brown, silt loam with 10YR 5/8 yellowish brown with light gray flaking<br>Note: STP located adjacent to road cut in possible berm |
| 51 | 1.2 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 52 | 1.0 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.0 ft: 10YR 4/6 yellowish brown, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 53 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 54 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 55 | 0.7 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-0.7 ft: 10YR 4/6 yellowish brown, channers, bedrock encountered at bottom |
| 56 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 57 | 1.0 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/6 yellowish brown, channers |
| 58 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 59 | 1.0 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/6 yellowish brown, channers |
| 60 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam |
| 61 | 1.2 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, channers |
| 62 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam |
| 63 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam |
| 64 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 65 | 1.3 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 66 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam |
| 67 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 68 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 69 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 70 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 72 | 1.3 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.8-1.3 ft: 10YR 5/6 yellowish brown, silt loam<br>Terminated at the water table, STP became inundated |
| 73 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 74 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 75 | 1.3 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.8-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 76 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 77 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 78 | 1.6 | Negative | 0-1.3 ft: 10YR 4/4 dark yellowish brown, silt loam<br>1.3-1.6 ft: 10YR 5/6 yellowish brown, silt loam |
| 79 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 80 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam |
| 81 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam |
| 82 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 83 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 84 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 85 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam |
| 86 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 87 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 88 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 89 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 90 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 91 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 92 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam |
| 93 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 98 | 0.7 | Negative | 0-0.4 ft: 10YR 5/6 yellowish brown, silt loam, channers<br>0.4-0.7 ft: 10YR 5/8 yellowish brown, silt loam, channers |
| 143 | 1.0 | Negative | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 191 | 0.9 | Negative | 0-0.5 ft: 10YR 5/6 yellowish brown, silt loam, channers<br>0.5-0.9 ft: 10YR 5/8 yellowish brown, silt loam, channers |
| 271 | 0.7 | Negative | 0-0.7: 10YR 4/4 dark yellowish brown, silt loam, channers<br>Terminated at bedrock |
| 272 | 0.8 | Negative | 0-0.5 ft: 10YR 5/6 yellowish brown, silt loam, channers<br>0.5-0.8 ft: 10YR 5/8 yellowish brown, silt loam, channers |
| 276 | 0.6 | Negative | 0-0.6 ft: 10YR 3/4 dark yellowish brown, silt loam,<br>Terminated due to presence of roadway gravel |
| 277 | 1.0 | Negative | 0-0.3 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.3-0.4 ft: 10YR 5/6 yellowish brown, silt loam |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| | | | 0.7-1.0 ft: 7.5YR 5/8 strong brown, silt loam, channers |
| 278 | 0.9 | Negative | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.4-0.9 ft: 10YR 5/8 yellowish brown, silt loam, channers with gray mixing |
| 282 | 0.6 | Negative | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-0.6 ft: 10YR 4/6 yellowish brown, silt loam, fill with bluestone gravel |
| 306 | 1.0 | Negative | 0-0.7 ft: 10YR 4/6 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 7.5YR 5/8 strong brown, silt loam, channers |
| 307 | 1.0 | Negative | 0-0.7 ft: 10YR 4/6 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 7.5YR 5/8 strong brown, silt loam, channers |
| 308 | 0.6 | Negative | 0-0.1 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.1-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, with lots of shale |
| 314 | 1.0 | Negative | 0-0.5 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.5-1.0 ft: 10YR 5/8 yellowish brown, silt loam, channers with light gray mixing |
| 316 | 1.1 | Negative | 0-0.8 ft: 10YR 5/6 yellowish brown, silt loam<br>0.8-1.1 ft: 7.5YR 5/8 strong brown, silt loam, channers |
| 317 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 318 | 0.7 | Negative | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam<br>Terminated due to roadway gravel |
| 322 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam |
| 324 | 1.2 | Negative | 0-0.9 ft: 10YR 4/6 yellowish brown, silt loam<br>0.9-1.2 ft: 10YR 6/8 yellowish brown, silt loam |
| 325 | 1.1 | Negative | 0-0.8 ft: 10YR 5/6 yellowish brown, silt loam, channers<br>0.8-1.1 ft: 7.5YR 5/8 strong brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 326 | 1.0 | Negative | 0-0.7 ft: 10YR 5/4 yellowish brown, silt loam, channers<br>0.7-1.0 ft: 7.5YR 6/4 light brown, silt loam, channers, wet and mixed with dark grey |
| 327 | 1.1 | Negative | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.6-1.1 ft: 10YR 5/8 strong brown, silt loam, channers, mixed with white grey |
| 355 | 1.0 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, contains gravel from nearby drainage outlet |
| 373 | 1.3 | Negative | 0-1.0 ft: 10YR 4/6 yellowish brown, silt loam<br>1.0-1.3 ft: 10YR 6/8 yellowish brown, silt loam |
| 411 | 1.1 | Negative | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 416 | 0.8 | Negative | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-0.8 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 417 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 418 | 1.1 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.9-1.1 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 419 | 0.8 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-0.8 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 420 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 421 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 422 | 1.2 | Negative | 0-0.25 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.25-1.2 ft: 10YR 4/6 yellowish brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Soils |
|---|---|---|---|
| 423 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 424 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 425 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 426 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |
| 427 | 1.2 | Negative | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, channers<br>0.9-1.2ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 428 | 1.3 | Negative | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown, 5% channers<br>1.0-1.3ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 429 | 1.1 | Negative | 0-0.3 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/6 yellowish brown, silt loam, channers |

*MMF Site*

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| 16 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0: 10YR 4/4 dark yellowish brown, silt loam |
| 18 | 0.7 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-0.7: 10YR 4/4 dark yellowish brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| 20 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 22 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 24 | 0.8 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-0.8: 10YR 4/4 dark yellowish brown, silt loam, channers |
| 36 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 38 | 1.0 | Negative | | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.6-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 40 | 0.8 | Negative | | 0-0.5 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.5-0.8 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 42 | 1.1 | Negative | | 0-0.8 ft: 10YR 3/4 dark yellowish brown, silt loam, channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 44 | 0.9 | Negative | | 0-0.6 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.6-0.9 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 46 | 0.8 | Negative | | 0-0.5 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.5-0.8 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 63 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 65 | 0.9 | Negative | | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.6-0.9 ft: 10YR 5/6 yellowish brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| 69 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 71 | 0.9 | Negative | | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.6-0.9 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 73 | 0.8 | Negative | | 0-0.5 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.5-0.8 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 74 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 75 | 1.1 | Negative | | 0-0.8 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 77 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, mottled with 10YR 5/6 yellowish brown, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 98 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 99 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 100 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 101 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 102 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 103 | 1.0 | Positive | Partial Lithic | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| | | | (Brewerton-Corner Notched) | 0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 103R1 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 103R2 | 1.0 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 103R4 | 1.1 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 103R5 | 1.0 | Negative | | 0-0.6 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.6-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 103R6 | 1.0 | Negative | | 0-0.6 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.6-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |
| 103R7 | 1.1 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 103R8 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 105 | 1.1 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 107 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |
| 109 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 111 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| 113 | 1.1 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 115 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |
| 117 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 119 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |
| 141 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 142 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 143 | 0.9 | Negative | | 0-0.5 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.5-0.9 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 145 | 0.9 | Negative | | 0-0.5 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.5-0.9 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 147 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 149 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 151 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 153 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| | | | | 0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 155 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 157 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |
| 159 | 1.0 | Negative | | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.6-1.0 ft: 10YR 5/6 yellowish brown, silt loam |
| 161 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |
| 163 | 1.0 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 191 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, flecked with 10YR 5/6 yellowish brown<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 5% channers |
| 193 | 1.1 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 10% channers |
| 195 | 1.2 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 197 | 1.2 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 199 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 201 | 1.2 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| 203 | 1.1 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 205 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam, 15% channers |
| 207 | 1.1 | Negative | | 0-0.8 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 209 | 1.1 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 211 | 1.2 | Negative | | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 233 | 1.3 | Negative | | 0-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam<br>1.0-1.3 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 235 | 1.0 | Negative | | 0-0.2 ft: 10YR 5/6 yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 5/6 yellowish brown, silt loam |
| 237 | 1.2 | Negative | | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 241 | 1.2 | Negative | | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 243 | 1.1 | Negative | | 0-0.7 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.7-1.1 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 245 | 1.2 | Negative | | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |

| STP Number | Base of Excavation (ft) | Cultural Materials (Positive/Negative) | Cultural Materials Collected | Soils |
|---|---|---|---|---|
| 249 | 1.2 | Negative | | 0-0.9 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.9-1.2 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 253 | 1.1 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.1 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 255 | 1.1 | Negative | | 0-0.3 ft: 10YR 4/4 dark yellowish brown, silt loam<br>0.3-1.1 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers |
| 279 | 1.1 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-1.1 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 281 | 1.15 | Negative | | 0-0.8 ft: 10YR 3/4 dark yellowish brown, silt loam, 5% channers<br>0.8-1.15 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 283 | 1.0 | Negative | | 0-0.7 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.7-1.0 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 285 | 1.1 | Negative | | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.6-1.1 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 287 | 0.9 | Negative | | 0-0.6 ft: 10YR 4/4 dark yellowish brown, silt loam, 5% channers<br>0.6-0.9 ft: 10YR 5/6 yellowish brown, silt loam, 15% channers |
| 289 | 0.9 | Negative | | 0-0.4 ft: 10YR 4/4 dark yellowish brown, silt loam, channers<br>0.4-0.9 ft: 10YR 5/6 yellowish brown, silt loam, channers |
| 291 | 1.0 | Negative | | 0-0.2 ft: 10YR 3/4 dark yellowish brown, silt loam<br>0.2-1.0 ft: 10YR 4/4 dark yellowish brown, silt loam |

**Appendix C – Photographs**

***Photo 1: Voelz Gate ACP, Representative Photograph of Southernmost Portion, Facing West***

***Photo 2: Voelz Gate ACP, Representative Photograph of Disked Field, Facing East***

***Photo 3: Voelz Gate ACP, Representative Photograph of Drainage in Northeastern Portion, Facing North***

***Photo 4: Voelz Gate ACP, Representative Photograph of Parking Lot Area, Facing Northwest***

***Photo 5: Voelz Gate ACP, Representative Photograph of Gravel Roadways and Utilities within Project Area, Facing North***

***Photo 6: Voelz Gate ACP, Representative Photograph of Subsurface Water Utility within Project Area, Facing Southwest***

***Photo 7: MMF, Representative Photograph of the Project Area's Southern Half, Facing Southeast***

***Photo 8: MMF, Representative Photograph of the Project Area's Northern Half, Facing Northeast***

***Photo 9: MMF, Representative Photograph of the Project Area's Northwestern Corner, Facing Northwest***

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

August 7, 2025

*Sent Via PA-SHARE*

RE: ER Project # 2024PR05401.002, Precision Missile Maintenance Facility and Voelz Gate Access Control Point, Department of Defense, Letterkenny Township, Franklin County

Dear Submitter,

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

**Archaeological Resources**
*No Archaeological Concerns - Environmental Review - Negative Survey Report/Negative Survey Form*

This report meets our standards and specifications as outlined in Guidelines for Archaeological Investigations in Pennsylvania (SHPO 2021) and the Secretary of the Interior's Guidelines for Archaeological Documentation. We agree with the recommendations of this report, and in our opinion, no further archaeological work is necessary for this project. If project plans should change and/or you should be made aware of historic property concerns, please reinitiate consultation with our office using PA-SHARE.

For questions concerning archaeological resources, please contact Justin McKeel at jusmckeel@pa.gov.

Sincerely,

Barbara Frederick
Environmental Review Division Manager

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# Appendix E
# Voelz Gate Traffic Study

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Stantec

# Letterkenny Voelz Gate Access Control Point Traffic Impact Study

Intersection of PA 997
& Voelz Gate Driveway
Township of Letterkenny, PA

Prepared for:

PennDOT District 8

Prepared by:

Stantec Consulting Services, Inc.
3001 Washington Boulevard, Suite 500
Arlington, Virginia
22201-2247

Adam Catherine, PE, PTOE
PA PE: 080769

October 4, 2024

## Table of Contents



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### LIST OF APPENDICIES



### LIST OF EXHIBITS

# 1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this Traffic Impact Study (TIS) on behalf of the United States Army Corp of Engineers (USACE) to evaluate the potential impacts of modifications to the existing Voelz Gate Access Control Point (ACP) at the intersection of Voelz Gate Driveway in Letterkenny Township, Pennsylvania. The Voelz Gate is an ACP that is used only for the screening and processing of trucks making deliveries. Staff and visitors are not permitted to utilize this gate. According to USACE, the proposed project entails modification of the Voelz Gate Access Control Point (ACP) to provide enhanced processing operations, queuing, and truck storage, and no additional truck trips are anticipated to be generated by the improvements. A conceptual site plan for the proposed modifications is in **Appendix A**.

## 1.1 SCOPE OF STUDY

The purpose of the proposed modifications to the ACP are to improve security screening and to enhance processing operations, queuing, and truck storage on site. An increase in truck traffic utilizing the gate is not anticipated. Therefore, a traffic impact study is not required based on PennDOT thresholds. However, the USACE requested a study for the intersection of Voelz Gate Driveway to determine if any additional improvements are warranted. Therefore, Stantec coordinated the scope of the Traffic Impact Study with PennDOT District 8-0. A copy of the scoping letter and PennDOT's response is contained in **Appendix B**.

This TIS analyzes the impacts of the proposed development on the adjoining roadways and intersections. As part of this study, Stantec has:

- Evaluated the traffic impact of the proposed development in different study analysis periods.
- Conducted a capacity and LOS analysis on the location for all different study analysis periods.
- Conducted sight distance analyses.
- Conducted a signal warrant analysis.
- Conducted an analysis of the need for turning lanes.
- Conducted a turning lane lengths analysis.

## 1.2 STUDY AREA

This study area includes the intersection of Voelz Gate Driveway (unsignalized) (**Exhibit 1).**

**PA 997 (Cumberland Highway)** is classified as a rural minor arterial. Within the study area, PA 997 is a northwest-southeast roadway with lane widths of 11 feet. There is one travel lane with a shoulder eight feet

in width in each direction and on-street parking is prohibited on either side. PA 997 has a posted speed limit of 55 mph.

**XXXX** is classified as a rural local roadway. Within the study area, XXXX is a northeast-southwest roadway with lane widths of 12 feet. One travel lane with no shoulder is provided for each direction and on-street parking is prohibited on either side of the road. XXXX has a posted speed limit of 35 mph.

**Voelz Gate Driveway** is a private ACP for the Letterkenny Army Depot and Letterkenny Munitions Center. One travel lane with no shoulder is provided for each direction. This road only serves commercial vehicles (trucks).

# 2.0 EXISTING CONDITIONS

Existing traffic conditions for the study area were analyzed to develop capacity analysis results, which were then compared to future traffic conditions. Capacity analysis results were informed by the data collection detailed in the following sections.

## 2.1 TRAFFIC VOLUME DATA

Turning movement counts were collected at the study intersection on Tuesday, December 5, 2023; Wednesday, December 6, 2023; and Thursday, December 7, 2023, to obtain traffic volumes for a "typical" day. Traffic was counted from 6:00 AM to 9:00 PM. PennDOT requested multiple days of data in order to establish a trip generation rate for the number of trucks entering and exiting the facility. However, for the purposes of the capacity analysis, the highest AM and PM peak hour volumes among the three days was used. The AM Peak hour was determined to be 6:45 AM – 7:45 AM and the PM Peak Hour was determined to be 3:30 PM - 4:30 PM. The collected traffic counts are shown in **Appendix C**.

The resulting 2023 Existing Condition AM and PM peak hour volumes are shown in **Exhibit 2.**

## 2.2 PEDESTRIAN AND BICYCLE FACILITIES

Turning movement counts revealed that there were no pedestrians or bicyclists utilizing the study intersection. Furthermore, there are currently no sidewalks or bicycle facilities within the project area.

## 2.3 CAPACITY ANALYSIS METHOD

Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operation conditions, was performed using Synchro 11, a software package which is based on the methodology of the *Highway Capacity Manual 6$^{th}$ Edition (HCM6)* to establish average volume to capacity (v/c) ratios, delays, and level of service (LOS) for each intersection. Existing and proposed roadway geometry and traffic data were entered into the model.

The v/c ratio relates the demand at a particular intersection (traffic volume) to the available capacity. The available capacity for each movement varies depending on number of lanes, lane width, perception/reaction time, green time, and cycle length, among others. A v/c ratio of 1.0 means that the demand for a particular movement is equal to the capacity. A movement with a v/c ratio greater than 1.0 is considered undesirable because the movement volume exceeds the capacity and results in queuing, indicating unmet demand along that approach.

LOS is an evaluation of the quality of operation of an intersection and is a measure of the average delay a driver experiences while traveling through the intersection. LOS is dependent on a range of defined operating conditions such as traffic demand, lane geometry, and traffic signal timing and phasing. LOS can range from A to F and is based on the average control delay per vehicle in seconds. For a signalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 80 seconds per vehicle or where the v/c ratio is greater than 1.0. For an unsignalized intersection, LOS A indicates operations with an average control delay less than 10 seconds per vehicle, while LOS F describes operations with an average control delay in excess of 50 seconds per vehicle or where the v/c ratio is greater than 1.0. The *HCM6* delay criteria for signalized and unsignalized intersections are summarized in **Table 1**. All Synchro 11 output files are included in **Appendix D**.

**Table 1: LOS Thresholds**

| Level of Service | Average Control Delay (seconds/vehicle)<br>Unsignalized |
|---|---|
| **A** | Less than 10.0 |
| **B** | ≥ 10.0 and < 15.0 |
| **C** | ≥ 15.0 and < 25.0 |
| **D** | ≥ 25.0 and < 35.0 |
| **E** | ≥ 35.0 and < 50.0 |
| **F** | Greater than or equal to 50.0 or<br>v/c greater than 1.0 |

**Source:** ***Highway Capacity Manual 6th Edition***

## 2.4 2023 EXISTING CONDITION CAPACITY ANALYSIS RESULTS

The capacity analysis results (**Table 2**) show a minimum level of service of B for the AM peak hour and with a minimum level of service of C for the PM peak hour. However, the intersection operates at an overall level of service A during both peak hours.

**Table 2: 2023 Existing Condition LOS**

| Lane Group | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | v/c ratio | Delay (sec) | Level of Service | 95th %tile Queue (ft) | v/c ratio | Delay (sec) | Level of Service | 95th %tile Queue (ft) |
| **EB-LTR** | 0.00 | 10.8 | B | 0 | 0.00 | 13.3 | B | 0 |
| **WB-LTR** | 0.05 | 13.5 | B | 4 | 0.03 | 17.7 | C | 3 |
| **NB-LTR** | 0.00 | 0.2 | A | 0 | 0.00 | 0.0 | A | 0 |
| **SB-LTR** | 0.00 | 0.0 | A | 0 | 0.00 | 0.1 | A | 0 |
| **Intersection** | - | 0.6 | A | - | - | 0.3 | A | - |

# 3.0 2028 FUTURE CONDITION

The anticipated opening year for the proposed improvements to the Voelz Gate ACP is 2028. Therefore, a future analysis year of 2028 was selected for the capacity analysis. It was estimated that truck traffic would increase between 2.5-3% annually to and from the Voelz Gate Driveway. In order to be conservative, a 20% increase in truck traffic to and from the Voelz Gate Driveway was applied to the 2023 Existing Condition driveway volumes. However, given the very low number of peak hour driveway trucks, a 20% increase in truck traffic resulted in no change between the No Build and Build conditions for both peak hours. Therefore, only one 2028 Future Condition was analyzed. To develop 2028 Future Condition background growth volumes, a growth rate of 0.71% was used based on the growth factors for September 2023 to July 2024 table as supplied by the Bureau of Planning and Research. The capacity analysis results in **Table 3** indicate that existing LOS would be maintained, with a minimum level of service of B for the AM peak hour and with a minimum level of service of C for the PM peak hour. The intersection would continue to operate at an overall level of service A during both peak hours.

**Table 3: 2028 Future Condition LOS**

| Lane Group | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | v/c ratio | Delay (sec) | Level of Service | 95th %tile Queue (ft) | v/c ratio | Delay (sec) | Level of Service | 95th %tile Queue (ft) |
| **EB-LTR** | 0.00 | 10.9 | B | 0 | 0.00 | 13.7 | B | 0 |
| **WB-LTR** | 0.05 | 13.8 | B | 4 | 0.04 | 18.4 | C | 3 |
| **NB-LTR** | 0.00 | 0.2 | A | 0 | 0.00 | 0.0 | A | 0 |
| **SB-LTR** | 0.00 | 0.0 | A | 0 | 0.00 | 0.1 | A | 0 |
| **Intersection** | - | 0.6 | A | - | - | 0.3 | A | - |

## 3.1 SIGHT DISTANCE ANALYSIS

PennDOT TIS guidelines require a sight distance analysis for all site access driveways. Accordingly, an analysis was performed for Voelz Gate Driveway using form M-950S (**Appendix E**)**.** For turning movements to and from the site access driveway, a design vehicle of a combination truck was considered since that would be the primary type of vehicle accessing the site. Utilizing the 2018 AASHTO Green Book for intersections of stop control on the minor road it was calculated that left-turn required stopping sight distances should be multiplied by a factor of 1.53 and right-turn required stopping sight distances should be multiplied by a factor of 1.61 to account for the additional time it would take a combination truck to turn. **Table 4** shows that the existing sight distances satisfy required sight distances.

**Table 4: Driveway Site Distances**

| Driveway | Required Sight Distance (ft) | Actual Sight Distance (ft) |
|---|---|---|
| **Left Turn Sight Distance from Driveway** | 842 | 1,148 |
| **Right Turn Sight Distance from Driveway** | 848 | 775 |
| **NB PA 997 Stopping Sight Distance** | 527 | 1,057 |
| **Left turn from SB PA 997 to Driveway** | 842 | 1,175’ |

## 3.2 SIGNAL WARRANT ANALYSIS

A signal warrant analysis was to be performed for the intersection of XXXX. However, after review of the turning movement count data, it was determined that the signal warrant analysis was no longer needed due to the low volume counts at the intersection.

## 3.3 TURNING LANE WARRANT ANALYSIS

A turning lane warrant analysis was performed for the intersection of XXX for both the northbound left turn and southbound right turn movements. The results of the analysis indicate that turning lanes are not warranted in either direction for both peak hours. Therefore, turning lanes are not needed for this intersection. The turning lane warrants can be found in **Appendix F**.

# 4.0 CONCLUSION

The purpose of this TIS is to summarize the capacity analysis that was performed to evaluate the potential traffic impacts of the modifications to the Voelz Gate ACP at XXXX The analysis shows that the existing intersection operates at an overall LOS A in both AM and PM peak hours. The analysis of future conditions show that this level of service would be maintained in the 2028 build year because the proposed enhancements to the ACP are intended to enhance processing operations, queuing, and truck storage only, with no additional truck traffic anticipated to result from the gate improvements. The analysis indicates that there is adequate sight distance at the intersection and that turn lanes are not warranted. Therefore, no additional improvements at the intersection are necessary.

# EXHIBITS

# Appendix A: Site Plan

# Appendix B: Scoping

Stantec Consulting Services
1500 Spring Garden St #1100
Philadelphia PA 19130-4067

December 14, 2023
File: 177920196

**Attention: Mr. William Warden**
PennDOT Engineering District 8-0
2140 Herr Street
Harrisburg, PA 17103-1699

Dear Mr. Warden,

**Reference: Transportation Impact Study Scoping Meeting Application**
**Letterkenny Munitions Center – Voelz Gate Access Control Point**
**Township of Letterkenny, Franklin County, PA**

Stantec Consulting Services, Inc (Stantec) is pleased to submit the following updated Transportation Impact Study (TIS) Scoping Meeting Application, per the *Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits*, Revised July 2017 for the proposed development, located at the intersection of XXXX in Letterkenny Township, PA. This revised scoping meeting application has information that responds to PennDOT comments on the initial scoping form.

Based on the requirements of the US Army Corp of Engineers, the proposed modifications to the project site requires a Transportation Impact Study coordinated with local agencies. Therefore, a Transportation Impact Study will be prepared and submitted to Letterkenny Township and PennDOT Engineering District 8-0, generally in accordance with the scope outlined in this application.

If you have any questions or need additional information, please feel free to contact us.

Regards,

**Adam Catherine** PE, PTOE
Principal
Phone: 856 234-0800
Fax: 856 234-5926
Adam.Catherine@stantec.com

Stantec

# Transportation Impact Study

# (TIS) Scoping Meeting Application

Scoping Meeting Date: TBD

Applicant: Letterkenny Munitions Center

Applicant's Consultant: Stantec Consulting Services, Inc.

Applicant's Primary Contact: Adam Catherine, PE, PTOE

## (1) LOCATION OF PROPOSED DEVELOPMENT: (ATTACH LOCATION MAP IF AVAILABLE) PennDOT

Engineering Dist.: 8-0 County: Franklin County

Municipality: Township of Letterkenny

State Route(s) (SR): Cumberland Highway (S.R. 0997)

Segment(s)/Offset(s): S.R. 0997: 0550/3185 to 0560/0093

See **Attachment 1** for location map.

## (2) DESCRIPTION OF DEVELOPMENT: (ATTACH SITE PLAN IF AVAILABLE)

The proposed area of development is located on the eastern boundary of the of the Letterkenny Army Depot and Letterkenny Munitions Center where traffic travelling on Cartridge Road is controlled inbound and outbound by the Voelz Gate Access Control Point (ACP) at the intersection XXXX. See **Attachment 2** for conceptual site plan. The controlled-access roadway within the military facility and gatehouse / processing facilities area planned to be modified to provide enhanced processing operations, queuing, and truck storage. In addition, the current selected alternative for the ACP includes the relocation of the driveway approximately 150 feet south of its current location. Assumptions of the potential modification to traffic patterns are listed below:

- The purpose of the modifications is to enhance operations and security and there is no anticipated change to average daily traffic volumes entering and exiting the Voelz Gate ACP
- There will be no change to arrival and departure pattern (time of day and peak surge) for traffic entering and exiting through the Voelz Gate ACP
- The Voelz Gate ACP will continue to only serve commercial vehicles (trucks). This ACP will not provide access for other vehicle types.

Currently, there are no sidewalks or bicycle facilities within the project area. The unsignalized intersection of XXXX operates as a two-way stop-controlled intersection with PA 997 northbound and southbound operating as the major approaches. This section of PA 997 is generally one lane in each direction with shoulders, no curb, and grass drainage ditches along both sides of the roadway.

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## (3) DEVELOPING SCHEDULE AND STAGING

Anticipated Opening Date: 2028

Full Build-Out Date: 2028

Describe Proposed Development Schedule/Staging:

1. N/A

## (4) TRIP GENERATION

(Use the most recent edition of "Institute of Transportation Engineers (ITE) Trip Generation," unless the Department approves another source. Non-ITE methods must be fully justified based on surveys of multiple sites of the same land use type and size.)

Trip generation for the proposed development will be based on:

Existing traffic counts at the current driveway. There is no anticipated change to the volume or the distribution of traffic entering the gate. Therefore, existing counts will be used in the analysis.

## (5) ESTIMATED DAILY TRIP GENERATION/DRIVEWAY CLASSIFICATION

(a) Estimated Daily Trip Generation of Proposed Development –

a. No change in site trip generation. Approximately 50 total trucks per day

(b) Driveway Classification Based on Trip Generation and One Access Point:

Low Volume

## (6) TRANSPORTATION IMPACT STUDY REQUIRED?

_____ No

__X___ Yes, based on: _____ 3,000 or more vehicle trips/day generated

_____ During any one-hour time period, 100 or more new (added) vehicle trips generated entering or 100 or more new (added) vehicle trips generated exiting development.

__X__ Other considerations as described below:

Modification to existing intersection with State Route, and requirement by US Army Corp of Engineers

## (7) TRAFFIC IMPACT ASSESSMENT REQUIRED?

__X__ No _____ Yes

(If a TIS is required, the following sections of this checklist will be discussed at the TIS Scoping Meeting. The applicant may provide preliminary information.)

## (8) TIS STUDY AREA

Roadway and Study Intersections:

- Voelz Gate ACP

A location map is provided, see **Attachment 1**.

**Land use context (Refer to Smart Transportation Handbook)**

Land Use Context – Rural

**Transportation Context:**

- – Minor Arterial
- – Local Roadway

Known Congestion Areas

Not known at this time.

Known Safety Concerns

Not known at this time.

Known Environmental Constraints

Not known at this time.

Pedestrian/Bike Review (Community Centers, Parks, Schools, etc.)

Not known at this time.

Transit Review (Current routes/stops)

Not known at this time.

## (9) STUDY AREA TYPE

_____ Urban __X__ Rural

## (10) TIS ANALYSIS PERIODS AND TIMES

(List periods and times. Normal analysis periods are existing conditions, 5 years in the future without development, and 5 years in the future with development. Normal analysis times for each period are the AM peak hour and the PM peak hour, and the peak hour of site-generated traffic).

Study Analysis Periods:

- 2023 Existing Condition
- 2028 No Build Condition
- 2028 Build Condition

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Study Time Periods:

- Weekday morning peak period (6:00 AM to 9:00 AM)
- Weekday afternoon peak period (3:00 PM to 6:00 PM)

## (11) TRAFFIC ADJUSTMENT FACTORS

(a) Seasonal Adjustment: (Identify counts requiring adjustment and methodology).

None

(b) Annual Base Traffic Growth: 0.7%/yr
Source: Franklin County Population Growth Forecast 2020-2030

Stantec will contact the Township of Letterkenny and Frankling County to obtain information regarding planned developments within or adjacent to the study area. Site-specific trips, where the location and peak period trip generation are known will be included as surcharged volume into the 2028 No Build Condition and 2028 Build Condition traffic analysis model.

(c) Pass-By Trips:

None

(d) Captured Trips for Multi-Use Sites:

None

(e) Modal Split Reductions

N/A

(f) Other Reductions

No other reductions proposed

## (12) OTHER PROJECTS WITHIN STUDY AREA TO BE ADDED TO BASE TRAFFIC

(Identify proposed developments with issues permits that need to be included.)

Please provide information regarding any proposed developments that will have an effect on traffic operations within the study area and should be included in the Transportation Impact Study.

Not known at this time.

## (13) TRIP DISTRIBUTION AND ASSIGNMENT

(Describe; explain/justify; attach diagram and related information.)

Turning movement counts were conducted at the intersection with PA 997 and Iron Bridge Road/Voelz Gate driveway to measure vehicles entering and exiting the driveway to verify the trip generation and distribution of the driveway. Counts were conducted between 6:00 AM and 9:00 PM on Tuesday 12/5/2023, Wednesday 12/6/2023, and Thursday 12/7/2023. The raw count data can be found in

**Attachment 3** to this scoping form submission and is summarized in the table below. Please note that this is a truck-only gate so all vehicles entering and exiting are trucks. The data shows that the driveway experiences an average of 6 AM peak hour trips, 3 PM peak hour trips, and 50 total daily trips.

| Period | Date | Entering | | | Exiting | | |
|---|---|---|---|---|---|---|---|
| | | PA 997 NB-L | PA 997 SB-R | Total | Left | Right | Total |
| AM Peak Hour of Intersection (6:45 AM – 7:45 AM) | Tuesday | 3 | 1 | 4 | 0 | 0 | 0 |
| | Wednesday | 2 | 0 | 2 | 0 | 1 | 1 |
| | Thursday | 6 | 0 | 6 | 0 | 4 | 4 |
| | **Average** | **4** | **0** | **4** | **0** | **2** | **2** |
| PM Peak Hour of Intersection (3:30 PM – 4:30 PM) | Tuesday | 0 | 1 | 1 | 0 | 3 | 3 |
| | Wednesday | 1 | 0 | 1 | 1 | 1 | 2 |
| | Thursday | 2 | 0 | 2 | 0 | 0 | 0 |
| | **Average** | **1** | **0** | **1** | **0** | **2** | **2** |
| Total Weekday | Tuesday | 26 | 6 | 32 | 3 | 35 | 38 |
| | Wednesday | 18 | 2 | 20 | 3 | 17 | 20 |
| | Thursday | 19 | 0 | 19 | 2 | 19 | 21 |
| | **Average** | **21** | **3** | **24** | **3** | **24** | **26** |

## (14) APPROVAL OF DATA COLLECTION ELEMENTS AND METHODOLOGIES

| Location | Period | Type |
|---|---|---|
| Voelz Gate ACP | Utilizing data already collected (see Section 13) | TMC |

## (15) CAPACITY AND LOS ANALYSIS

| Location | Period | Type |
|---|---|---|
| / Voelz Gate ACP | Weekday 6-9 AM and 3-6 PM | HCM 6th Edition via Synchro 11 |

## (16) ROADWAY IMPROVEMENTS/MODIFICATIONS BY OTHERS TO BE INCLUDED:

(Projects programmed for construction of other developments with issued permits.)

Not known at this time.

## (17) OTHER NEEDED ANALYSIS

(a) Sight Distance Analysis:
(Required for all site access driveways; identify other locations)

Will be completed for proposed Voelz Gate ACP.

(b) Signal Warrant Analysis:
(Identify locations)

Will be completed for proposed Voelz Gate ACP.

(c) Required Signal Phasing/Timing Modifications:
(Determine for all signalized intersections; specify methodology)

N/A

(d) Traffic Signal Corridor/Network Analysis:
(Identify locations/methodology)

N/A

(e) Analysis of the Need for Turning Lanes:
(Identify locations/methodology)

Will be completed for proposed Voelz Gate ACP / Synchro 11.

(f) Turning Lane Lengths:
(Identify methodology to be used)

Will be completed for proposed Voelz Gate ACP / Synchro 11.

(g) Left Turn Signal Phasing Analysis:
(Identify locations/methodology)

N/A

(h) Queuing Analysis:
(Identify locations/methodology)

Will be completed for proposed Voelz Gate ACP / Synchro 11.

(i) Gap Studies:
(Identify locations/methodology)

Not proposed at this time.

(j) Crash Analysis:
(Identify locations)

Crash data will be reviewed, upon request.

(k) Weaving Analysis:

(Identify locations)

N/A

(l) Other Required Studies:
(Specify locations/methodology)

None proposed at this time.

## (18) ADDITIONAL COMMENTS OR RECCOMENDATIONS RELATIVE TO THE SCOPE OF THE TIS:

_____ Date: 12/14/2023
Signature of Applicant's Engineer

_____ Date: _____
Signature of District Traffic PennDOT Representative

_____ Date: _____
Signature of District Permit PennDOT Representative (if present)

_____ Date: _____
Signature of Municipal Traffic Representative

## (17) ADDITIONAL COMMENTS OR RECOMMENDATIONS RELATIVE TO THE SCOPE OF THE TIS:

**Additional Comments:**
None at this time.

## PennDOT Review Comments: (Current Cycle Comments)

1). The District Traffic Unit has reviewed the submitted Cycle 3 TIS scope application and has found it to be acceptable. Please provide a Site Access Evaluation with the HOP submission. A scoping meeting is not necessary, however, if the project team, municipality or the local Municipal Planning Organization (MPO) desires a meeting, please contact our office to discuss. The Site Access Evaluation must be signed and sealed by a professional engineer licensed in Pennsylvania and include sight distance analyses, crash data analyses, capacity analyses for the AM/PM peak hours, turn lane warrant/length analyses for the AM/PM peak hours, trip distribution and assignment information including calculations and backup data, and documentation from the municipality and MPO of scope acceptance. Also, please use the appropriate growth rate of 0.71 from the Growth Factors for September 2023 to July 2024 table as supplied by the Bureau of Planning and Research. In addition, the proposed driveway should align with  as the Conceptual Site Plan appears to show the proposed driveway offset to the south.

***After review of the scoping meeting application, the Department will contact the applicant regarding the need for a scoping meeting prior to applying for a highway occupancy permit.***

**This Electronic Copy Created on:** 2024-01-19 14:23:52

# Appendix C: Count Data

www.TSTData.com
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Coatesville, Pennsylvania, United States 19320
610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/05/2023

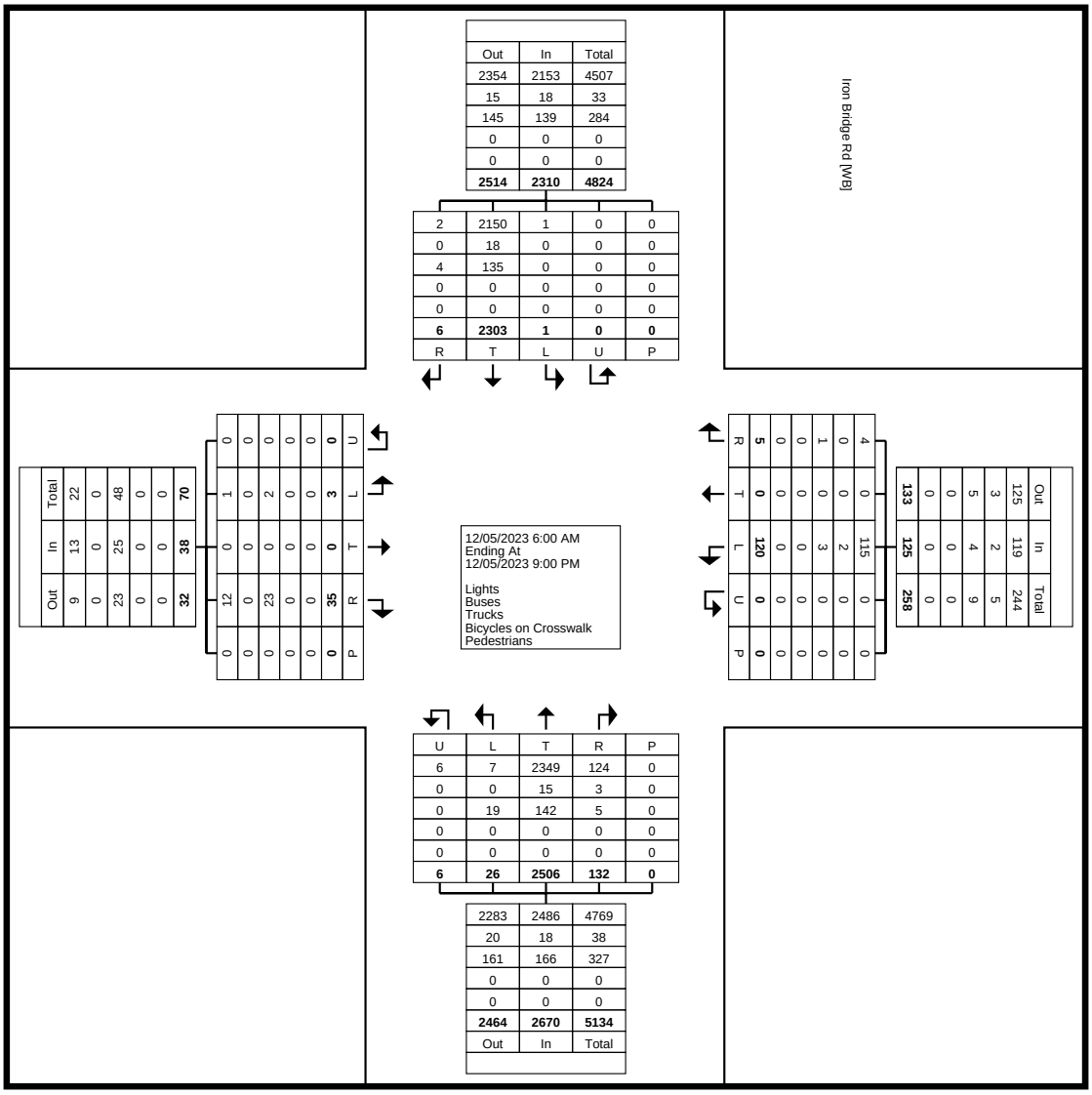

# Turning Movement Data

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 10 | 0 | 0 | 0 | 10 | 1 | 75 | 0 | 0 | 0 | 76 | 88 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 22 | 0 | 0 | 0 | 22 | 0 | 78 | 0 | 0 | 0 | 78 | 103 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 68 | 0 | 0 | 0 | 68 | 89 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 20 | 3 | 0 | 0 | 23 | 0 | 87 | 0 | 0 | 0 | 87 | 118 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 15 | 0 | 71 | 3 | 0 | 0 | 74 | 1 | 308 | 0 | 0 | 0 | 309 | 398 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 1 | 21 | 0 | 0 | 0 | 22 | 0 | 63 | 0 | 0 | 0 | 63 | 92 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 23 | 2 | 0 | 0 | 25 | 0 | 93 | 1 | 0 | 0 | 94 | 124 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 29 | 1 | 0 | 0 | 32 | 0 | 102 | 0 | 0 | 0 | 102 | 135 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 27 | 0 | 0 | 0 | 29 | 0 | 61 | 0 | 0 | 0 | 61 | 92 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 15 | 5 | 100 | 3 | 0 | 0 | 108 | 0 | 319 | 1 | 0 | 0 | 320 | 443 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 26 | 4 | 0 | 0 | 30 | 0 | 70 | 0 | 0 | 0 | 70 | 105 |
| 8:15 AM | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 38 | 0 | 0 | 0 | 39 | 0 | 51 | 1 | 0 | 0 | 52 | 93 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 20 | 0 | 0 | 0 | 20 | 0 | 58 | 0 | 0 | 0 | 58 | 80 |
| 8:45 AM | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 23 | 2 | 0 | 0 | 25 | 0 | 41 | 0 | 0 | 0 | 41 | 69 |
| Hourly Total | 0 | 0 | 4 | 0 | 0 | 4 | 8 | 0 | 0 | 0 | 0 | 8 | 1 | 107 | 6 | 0 | 0 | 114 | 0 | 220 | 1 | 0 | 0 | 221 | 347 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 34 | 1 | 1 | 0 | 36 | 0 | 32 | 0 | 0 | 0 | 32 | 70 |
| 9:15 AM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 28 | 2 | 0 | 0 | 30 | 0 | 40 | 0 | 0 | 0 | 40 | 72 |
| 9:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 37 | 2 | 0 | 0 | 39 | 0 | 50 | 0 | 0 | 0 | 50 | 93 |
| 9:45 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 23 | 0 | 0 | 0 | 23 | 0 | 40 | 0 | 0 | 0 | 40 | 69 |
| Hourly Total | 0 | 0 | 3 | 0 | 0 | 3 | 9 | 0 | 2 | 0 | 0 | 11 | 0 | 122 | 5 | 1 | 0 | 128 | 0 | 162 | 0 | 0 | 0 | 162 | 304 |
| 10:00 AM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 34 | 1 | 0 | 0 | 37 | 0 | 38 | 0 | 0 | 0 | 38 | 79 |
| 10:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 23 | 0 | 0 | 0 | 23 | 0 | 40 | 0 | 0 | 0 | 40 | 64 |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 32 | 3 | 0 | 0 | 35 | 0 | 31 | 0 | 0 | 0 | 31 | 67 |
| 10:45 AM | 0 | 0 | 3 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 27 | 1 | 1 | 0 | 31 | 0 | 39 | 1 | 0 | 0 | 40 | 76 |
| Hourly Total | 0 | 0 | 4 | 0 | 0 | 4 | 7 | 0 | 0 | 0 | 0 | 7 | 4 | 116 | 5 | 1 | 0 | 126 | 0 | 148 | 1 | 0 | 0 | 149 | 286 |
| 11:00 AM | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 29 | 0 | 1 | 0 | 33 | 0 | 37 | 0 | 0 | 0 | 37 | 73 |
| 11:15 AM | 0 | 0 | 4 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 31 | 1 | 0 | 0 | 33 | 0 | 33 | 0 | 0 | 0 | 33 | 71 |
| 11:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 5 | 1 | 36 | 3 | 1 | 0 | 41 | 0 | 40 | 0 | 0 | 0 | 40 | 87 |
| 11:45 AM | 0 | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 1 | 30 | 2 | 0 | 0 | 33 | 0 | 43 | 0 | 0 | 0 | 43 | 81 |
| Hourly Total | 0 | 0 | 9 | 0 | 0 | 9 | 9 | 0 | 1 | 0 | 0 | 10 | 6 | 126 | 6 | 2 | 0 | 140 | 0 | 153 | 0 | 0 | 0 | 153 | 312 |
| 12:00 PM | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 43 | 1 | 0 | 0 | 44 | 0 | 22 | 0 | 0 | 0 | 22 | 68 |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 42 | 3 | 0 | 0 | 45 | 0 | 35 | 0 | 0 | 0 | 35 | 83 |
| 12:30 PM | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 34 | 3 | 0 | 0 | 39 | 0 | 32 | 0 | 0 | 0 | 32 | 73 |
| 12:45 PM | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 44 | 3 | 0 | 0 | 48 | 0 | 38 | 0 | 0 | 0 | 38 | 89 |
| Hourly Total | 1 | 0 | 4 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 5 | 3 | 163 | 10 | 0 | 0 | 176 | 0 | 127 | 0 | 0 | 0 | 127 | 313 |
| 1:00 PM | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 27 | 2 | 1 | 0 | 30 | 0 | 33 | 0 | 0 | 0 | 33 | 68 |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 40 | 0 | 0 | 0 | 40 | 76 |
| 1:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 51 | 1 | 1 | 0 | 54 | 0 | 32 | 0 | 0 | 0 | 32 | 87 |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 47 | 0 | 0 | 0 | 48 | 0 | 38 | 0 | 0 | 0 | 38 | 87 |
| Hourly Total | 1 | 0 | 2 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 160 | 4 | 2 | 0 | 168 | 0 | 143 | 0 | 0 | 0 | 143 | 318 |
| 2:00 PM | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 38 | 2 | 0 | 0 | 41 | 0 | 38 | 0 | 0 | 0 | 38 | 85 |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 55 | 2 | 0 | 0 | 57 | 0 | 35 | 0 | 0 | 0 | 35 | 93 |
| 2:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 75 | 3 | 0 | 0 | 79 | 0 | 44 | 1 | 0 | 0 | 45 | 127 |
| 2:45 PM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 52 | 1 | 0 | 0 | 53 | 0 | 33 | 0 | 0 | 0 | 33 | 89 |
| Hourly Total | 0 | 0 | 3 | 0 | 0 | 3 | 9 | 0 | 1 | 0 | 0 | 10 | 2 | 220 | 8 | 0 | 0 | 230 | 0 | 150 | 1 | 0 | 0 | 151 | 394 |
| 3:00 PM | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 71 | 5 | 0 | 0 | 76 | 0 | 29 | 1 | 0 | 0 | 30 | 108 |
| 3:15 PM | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 84 | 3 | 0 | 0 | 87 | 0 | 36 | 0 | 0 | 0 | 36 | 130 |
| 3:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 | 5 | 0 | 0 | 137 | 0 | 27 | 0 | 0 | 0 | 27 | 165 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 86 | 5 | 0 | 0 | 91 | 0 | 31 | 1 | 0 | 0 | 32 | 126 |
| Hourly Total | 1 | 0 | 4 | 0 | 0 | 5 | 7 | 0 | 1 | 0 | 0 | 8 | 0 | 373 | 18 | 0 | 0 | 391 | 0 | 123 | 2 | 0 | 0 | 125 | 529 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 102 | 4 | 0 | 0 | 106 | 0 | 48 | 0 | 0 | 0 | 48 | 157 |
| 4:15 PM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 93 | 0 | 0 | 0 | 93 | 0 | 29 | 0 | 0 | 0 | 29 | 125 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 85 | 7 | 0 | 0 | 92 | 0 | 42 | 0 | 0 | 0 | 42 | 138 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 100 | 3 | 0 | 0 | 103 | 0 | 45 | 0 | 0 | 0 | 45 | 153 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 14 | 0 | 0 | 0 | 0 | 14 | 0 | 380 | 14 | 0 | 0 | 394 | 0 | 164 | 0 | 0 | 0 | 164 | 573 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 70 | 5 | 0 | 0 | 75 | 0 | 31 | 0 | 0 | 0 | 31 | 107 |
| 5:15 PM | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 72 | 4 | 0 | 0 | 78 | 0 | 31 | 0 | 0 | 0 | 31 | 111 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 62 | 5 | 0 | 0 | 67 | 0 | 36 | 0 | 0 | 0 | 36 | 108 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 4 | 0 | 0 | 56 | 0 | 22 | 0 | 0 | 0 | 22 | 78 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 7 | 2 | 256 | 18 | 0 | 0 | 276 | 0 | 120 | 0 | 0 | 0 | 120 | 404 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 35 | 5 | 0 | 0 | 40 | 0 | 25 | 0 | 0 | 0 | 25 | 66 |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 2 | 0 | 0 | 47 | 0 | 28 | 0 | 0 | 0 | 28 | 75 |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 3 | 0 | 0 | 34 | 0 | 23 | 0 | 0 | 0 | 23 | 57 |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 24 | 2 | 0 | 0 | 26 | 0 | 10 | 0 | 0 | 0 | 10 | 41 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 135 | 12 | 0 | 0 | 147 | 0 | 86 | 0 | 0 | 0 | 86 | 239 |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 19 | 2 | 0 | 0 | 21 | 0 | 11 | 0 | 0 | 0 | 11 | 33 |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 3 | 0 | 0 | 20 | 0 | 17 | 0 | 0 | 0 | 17 | 37 |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | 1 | 0 | 0 | 25 | 0 | 10 | 0 | 0 | 0 | 10 | 37 |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 5 | 0 | 0 | 37 | 0 | 8 | 0 | 0 | 0 | 8 | 45 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 92 | 11 | 0 | 0 | 103 | 0 | 46 | 0 | 0 | 0 | 46 | 152 |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 22 | 1 | 0 | 0 | 23 | 0 | 10 | 0 | 0 | 0 | 10 | 34 |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 1 | 0 | 0 | 15 | 0 | 5 | 0 | 0 | 0 | 5 | 20 |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 2 | 0 | 0 | 27 | 0 | 9 | 0 | 0 | 0 | 9 | 37 |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 24 | 5 | 0 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 10 | 40 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 85 | 9 | 0 | 0 | 95 | 0 | 34 | 0 | 0 | 0 | 34 | 131 |
| Grand Total | 3 | 0 | 35 | 0 | 0 | 38 | 120 | 0 | 5 | 0 | 0 | 125 | 26 | 2506 | 132 | 6 | 0 | 2670 | 1 | 2303 | 6 | 0 | 0 | 2310 | 5143 |
| Approach % | 7.9 | 0.0 | 92.1 | 0.0 | - | - | 96.0 | 0.0 | 4.0 | 0.0 | - | - | 1.0 | 93.9 | 4.9 | 0.2 | - | - | 0.0 | 99.7 | 0.3 | 0.0 | - | - | - |
| Total % | 0.1 | 0.0 | 0.7 | 0.0 | - | 0.7 | 2.3 | 0.0 | 0.1 | 0.0 | - | 2.4 | 0.5 | 48.7 | 2.6 | 0.1 | - | 51.9 | 0.0 | 44.8 | 0.1 | 0.0 | - | 44.9 | - |
| Lights | 1 | 0 | 12 | 0 | - | 13 | 115 | 0 | 4 | 0 | - | 119 | 7 | 2349 | 124 | 6 | - | 2486 | 1 | 2150 | 2 | 0 | - | 2153 | 4771 |
| % Lights | 33.3 | - | 34.3 | - | - | 34.2 | 95.8 | - | 80.0 | - | - | 95.2 | 26.9 | 93.7 | 93.9 | 100.0 | - | 93.1 | 100.0 | 93.4 | 33.3 | - | - | 93.2 | 92.8 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | 0 | - | 2 | 0 | 15 | 3 | 0 | - | 18 | 0 | 18 | 0 | 0 | - | 18 | 38 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | 1.7 | - | 0.0 | - | - | 1.6 | 0.0 | 0.6 | 2.3 | 0.0 | - | 0.7 | 0.0 | 0.8 | 0.0 | - | - | 0.8 | 0.7 |
| Trucks | 2 | 0 | 23 | 0 | - | 25 | 3 | 0 | 1 | 0 | - | 4 | 19 | 142 | 5 | 0 | - | 166 | 0 | 135 | 4 | 0 | - | 139 | 334 |
| % Trucks | 66.7 | - | 65.7 | - | - | 65.8 | 2.5 | - | 20.0 | - | - | 3.2 | 73.1 | 5.7 | 3.8 | 0.0 | - | 6.2 | 0.0 | 5.9 | 66.7 | - | - | 6.0 | 6.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/05/2023


Turning Movement Data Plot

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610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/05/2023


# Turning Movement Peak Hour Data (6:45 AM)

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 20 | 3 | 0 | 0 | 23 | 0 | 87 | 0 | 0 | 0 | 87 | 118 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 1 | 21 | 0 | 0 | 0 | 22 | 0 | 63 | 0 | 0 | 0 | 63 | 92 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 23 | 2 | 0 | 0 | 25 | 0 | 93 | 1 | 0 | 0 | 94 | 124 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 29 | 1 | 0 | 0 | 32 | 0 | 102 | 0 | 0 | 0 | 102 | 135 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 | 3 | 93 | 6 | 0 | 0 | 102 | 0 | 345 | 1 | 0 | 0 | 346 | 469 |
| Approach % | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 2.9 | 91.2 | 5.9 | 0.0 | - | - | 0.0 | 99.7 | 0.3 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 4.5 | 0.0 | 0.0 | 0.0 | - | 4.5 | 0.6 | 19.8 | 1.3 | 0.0 | - | 21.7 | 0.0 | 73.6 | 0.2 | 0.0 | - | 73.8 | - |
| PHF | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.656 | 0.000 | 0.000 | 0.000 | - | 0.656 | 0.375 | 0.802 | 0.500 | 0.000 | - | 0.797 | 0.000 | 0.846 | 0.250 | 0.000 | - | 0.848 | 0.869 |
| Lights | 0 | 0 | 0 | 0 | - | 0 | 20 | 0 | 0 | 0 | - | 20 | 0 | 82 | 6 | 0 | - | 88 | 0 | 321 | 0 | 0 | - | 321 | 429 |
| % Lights | - | - | - | - | - | - | 95.2 | - | - | - | - | 95.2 | 0.0 | 88.2 | 100.0 | - | - | 86.3 | - | 93.0 | 0.0 | - | - | 92.8 | 91.5 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | 1 | 0 | 7 | 0 | 0 | - | 7 | 9 |
| % Buses | - | - | - | - | - | - | 4.8 | - | - | - | - | 4.8 | 0.0 | 1.1 | 0.0 | - | - | 1.0 | - | 2.0 | 0.0 | - | - | 2.0 | 1.9 |
| Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 3 | 10 | 0 | 0 | - | 13 | 0 | 17 | 1 | 0 | - | 18 | 31 |
| % Trucks | - | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | 100.0 | 10.8 | 0.0 | - | - | 12.7 | - | 4.9 | 100.0 | - | - | 5.2 | 6.6 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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184 Baker Rd

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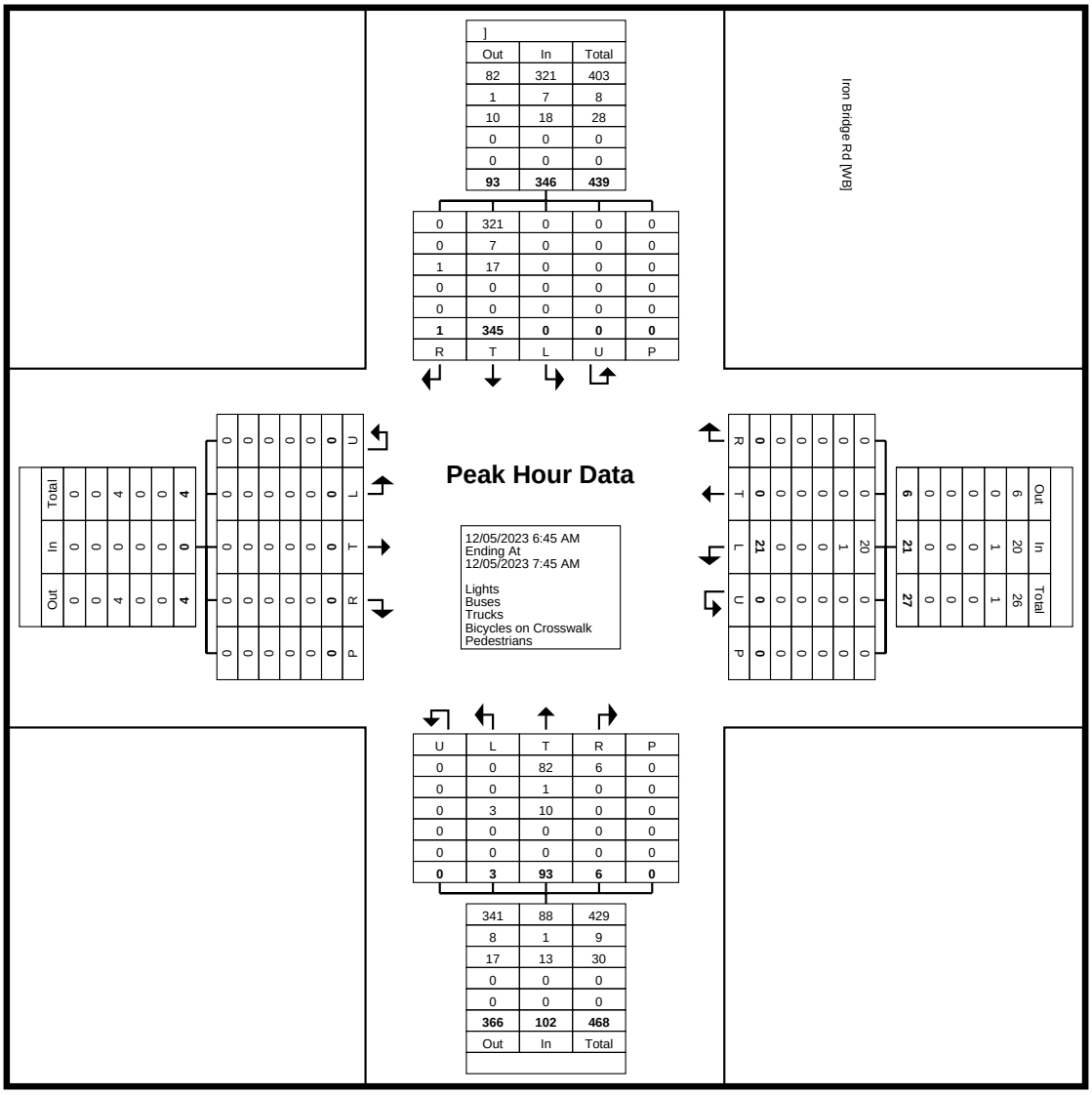
Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Start Date: 12/05/2023
Page No: 5




| ] | | |
|---|---|---|
| Out | In | Total |
| 82 | 321 | 403 |
| 1 | 7 | 8 |
| 10 | 18 | 28 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **93** | **346** | **439** |

| | | | | |
|---|---|---|---|---|
| 0 | 321 | 0 | 0 | 0 |
| 0 | 7 | 0 | 0 | 0 |
| 1 | 17 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **1** | **345** | **0** | **0** | **0** |
| R | T | L | U | P |

| | | | | |
|---|---|---|---|---|
| U | L | T | R | P |
| 0 | 0 | 82 | 6 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 3 | 10 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **3** | **93** | **6** | **0** |

| | | |
|---|---|---|
| 341 | 88 | 429 |
| 8 | 1 | 9 |
| 17 | 13 | 30 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **366** | **102** | **468** |
| Out | In | Total |

Turning Movement Peak Hour Data Plot (6:45 AM)

www.TSTData.com
184 Baker Rd

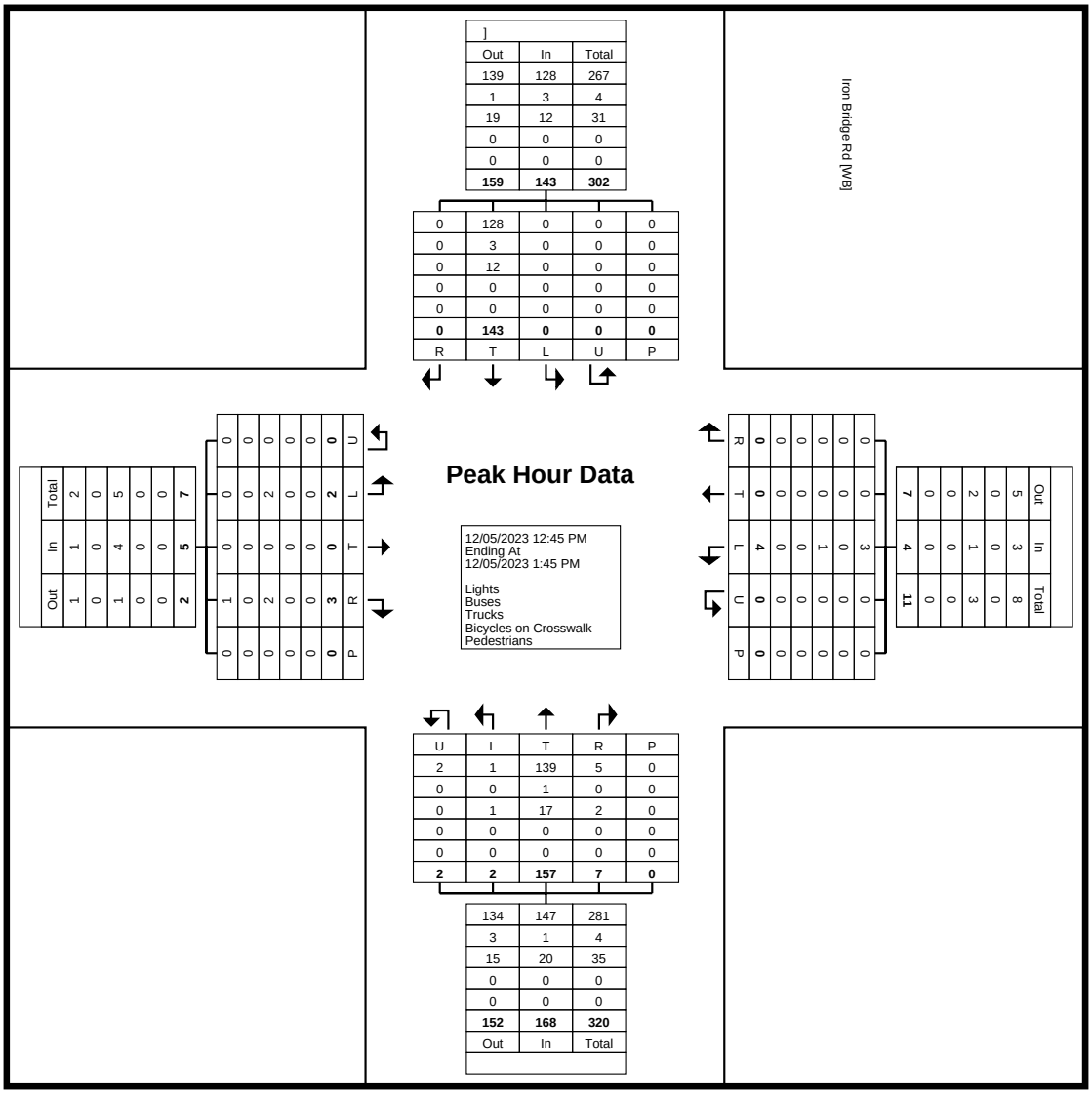
Coatesville, Pennsylvania, United States 19320
610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Start Date: 12/05/2023


# Turning Movement Peak Hour Data (12:45 PM)

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:45 PM | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 44 | 3 | 0 | 0 | 48 | 0 | 38 | 0 | 0 | 0 | 38 | 89 |
| 1:00 PM | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 27 | 2 | 1 | 0 | 30 | 0 | 33 | 0 | 0 | 0 | 33 | 68 |
| 1:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 40 | 0 | 0 | 0 | 40 | 76 |
| 1:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 51 | 1 | 1 | 0 | 54 | 0 | 32 | 0 | 0 | 0 | 32 | 87 |
| Total | 2 | 0 | 3 | 0 | 0 | 5 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 157 | 7 | 2 | 0 | 168 | 0 | 143 | 0 | 0 | 0 | 143 | 320 |
| Approach % | 40.0 | 0.0 | 60.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 1.2 | 93.5 | 4.2 | 1.2 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.6 | 0.0 | 0.9 | 0.0 | - | 1.6 | 1.3 | 0.0 | 0.0 | 0.0 | - | 1.3 | 0.6 | 49.1 | 2.2 | 0.6 | - | 52.5 | 0.0 | 44.7 | 0.0 | 0.0 | - | 44.7 | - |
| PHF | 0.500 | 0.000 | 0.750 | 0.000 | - | 0.625 | 0.333 | 0.000 | 0.000 | 0.000 | - | 0.333 | 0.500 | 0.770 | 0.583 | 0.500 | - | 0.778 | 0.000 | 0.894 | 0.000 | 0.000 | - | 0.894 | 0.899 |
| Lights | 0 | 0 | 1 | 0 | - | 1 | 3 | 0 | 0 | 0 | - | 3 | 1 | 139 | 5 | 2 | - | 147 | 0 | 128 | 0 | 0 | - | 128 | 279 |
| % Lights | 0.0 | - | 33.3 | - | - | 20.0 | 75.0 | - | - | - | - | 75.0 | 50.0 | 88.5 | 71.4 | 100.0 | - | 87.5 | - | 89.5 | - | - | - | 89.5 | 87.2 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 3 | 0 | 0 | - | 3 | 4 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | - | 0.6 | - | 2.1 | - | - | - | 2.1 | 1.3 |
| Trucks | 2 | 0 | 2 | 0 | - | 4 | 1 | 0 | 0 | 0 | - | 1 | 1 | 17 | 2 | 0 | - | 20 | 0 | 12 | 0 | 0 | - | 12 | 37 |
| % Trucks | 100.0 | - | 66.7 | - | - | 80.0 | 25.0 | - | - | - | - | 25.0 | 50.0 | 10.8 | 28.6 | 0.0 | - | 11.9 | - | 8.4 | - | - | - | 8.4 | 11.6 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




| ] | | |
|---|---|---|
| Out | In | Total |
| 139 | 128 | 267 |
| 1 | 3 | 4 |
| 19 | 12 | 31 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **159** | **143** | **302** |

| | | | | |
|---|---|---|---|---|
| 0 | 128 | 0 | 0 | 0 |
| 0 | 3 | 0 | 0 | 0 |
| 0 | 12 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **143** | **0** | **0** | **0** |
| R | T | L | U | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | U |
| 0 | 0 | 0 | 2 | 0 | 0 | **2** | L |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | T |
| 1 | 0 | 0 | 2 | 0 | 0 | **3** | R |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 2 | 0 | 5 | 0 | 0 | 0 | **7** |
| In | 1 | 0 | 4 | 0 | 0 | 0 | **5** |
| Out | 1 | 0 | 1 | 0 | 0 | 0 | **2** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| T | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| L | **4** | 0 | 0 | 1 | 0 | 3 | 0 |
| U | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| P | **0** | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Out | 5 | 0 | 2 | 0 | 0 | 0 | **7** |
| In | 3 | 0 | 1 | 0 | 0 | 0 | **4** |
| Total | 8 | 0 | 3 | 0 | 0 | 0 | **11** |

| U | L | T | R | P |
|---|---|---|---|---|
| 2 | 1 | 139 | 5 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 17 | 2 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **2** | **2** | **157** | **7** | **0** |

| | | |
|---|---|---|
| 134 | 147 | 281 |
| 3 | 1 | 4 |
| 15 | 20 | 35 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **152** | **168** | **320** |
| Out | In | Total |

Turning Movement Peak Hour Data Plot (12:45 PM)

www.TSTData.com
184 Baker Rd

Coatesville, Pennsylvania, United States 19320
610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/05/2023


# Turning Movement Peak Hour Data (3:15 PM)

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 3:15 PM | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 84 | 3 | 0 | 0 | 87 | 0 | 36 | 0 | 0 | 0 | 36 | 130 |
| 3:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 | 5 | 0 | 0 | 137 | 0 | 27 | 0 | 0 | 0 | 27 | 165 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 86 | 5 | 0 | 0 | 91 | 0 | 31 | 1 | 0 | 0 | 32 | 126 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 102 | 4 | 0 | 0 | 106 | 0 | 48 | 0 | 0 | 0 | 48 | 157 |
| Total | 0 | 0 | 3 | 0 | 0 | 3 | 10 | 0 | 1 | 0 | 0 | 11 | 0 | 404 | 17 | 0 | 0 | 421 | 0 | 142 | 1 | 0 | 0 | 143 | 578 |
| Approach % | 0.0 | 0.0 | 100.0 | 0.0 | - | - | 90.9 | 0.0 | 9.1 | 0.0 | - | - | 0.0 | 96.0 | 4.0 | 0.0 | - | - | 0.0 | 99.3 | 0.7 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.5 | 0.0 | - | 0.5 | 1.7 | 0.0 | 0.2 | 0.0 | - | 1.9 | 0.0 | 69.9 | 2.9 | 0.0 | - | 72.8 | 0.0 | 24.6 | 0.2 | 0.0 | - | 24.7 | - |
| PHF | 0.000 | 0.000 | 0.375 | 0.000 | - | 0.375 | 0.625 | 0.000 | 0.250 | 0.000 | - | 0.550 | 0.000 | 0.765 | 0.850 | 0.000 | - | 0.768 | 0.000 | 0.740 | 0.250 | 0.000 | - | 0.745 | 0.876 |
| Lights | 0 | 0 | 1 | 0 | - | 1 | 9 | 0 | 1 | 0 | - | 10 | 0 | 391 | 16 | 0 | - | 407 | 0 | 137 | 0 | 0 | - | 137 | 555 |
| % Lights | - | - | 33.3 | - | - | 33.3 | 90.0 | - | 100.0 | - | - | 90.9 | - | 96.8 | 94.1 | - | - | 96.7 | - | 96.5 | 0.0 | - | - | 95.8 | 96.0 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 5 | 1 | 0 | - | 6 | 0 | 2 | 0 | 0 | - | 2 | 8 |
| % Buses | - | - | 0.0 | - | - | 0.0 | 0.0 | - | 0.0 | - | - | 0.0 | - | 1.2 | 5.9 | - | - | 1.4 | - | 1.4 | 0.0 | - | - | 1.4 | 1.4 |
| Trucks | 0 | 0 | 2 | 0 | - | 2 | 1 | 0 | 0 | 0 | - | 1 | 0 | 8 | 0 | 0 | - | 8 | 0 | 3 | 1 | 0 | - | 4 | 15 |
| % Trucks | - | - | 66.7 | - | - | 66.7 | 10.0 | - | 0.0 | - | - | 9.1 | - | 2.0 | 0.0 | - | - | 1.9 | - | 2.1 | 100.0 | - | - | 2.8 | 2.6 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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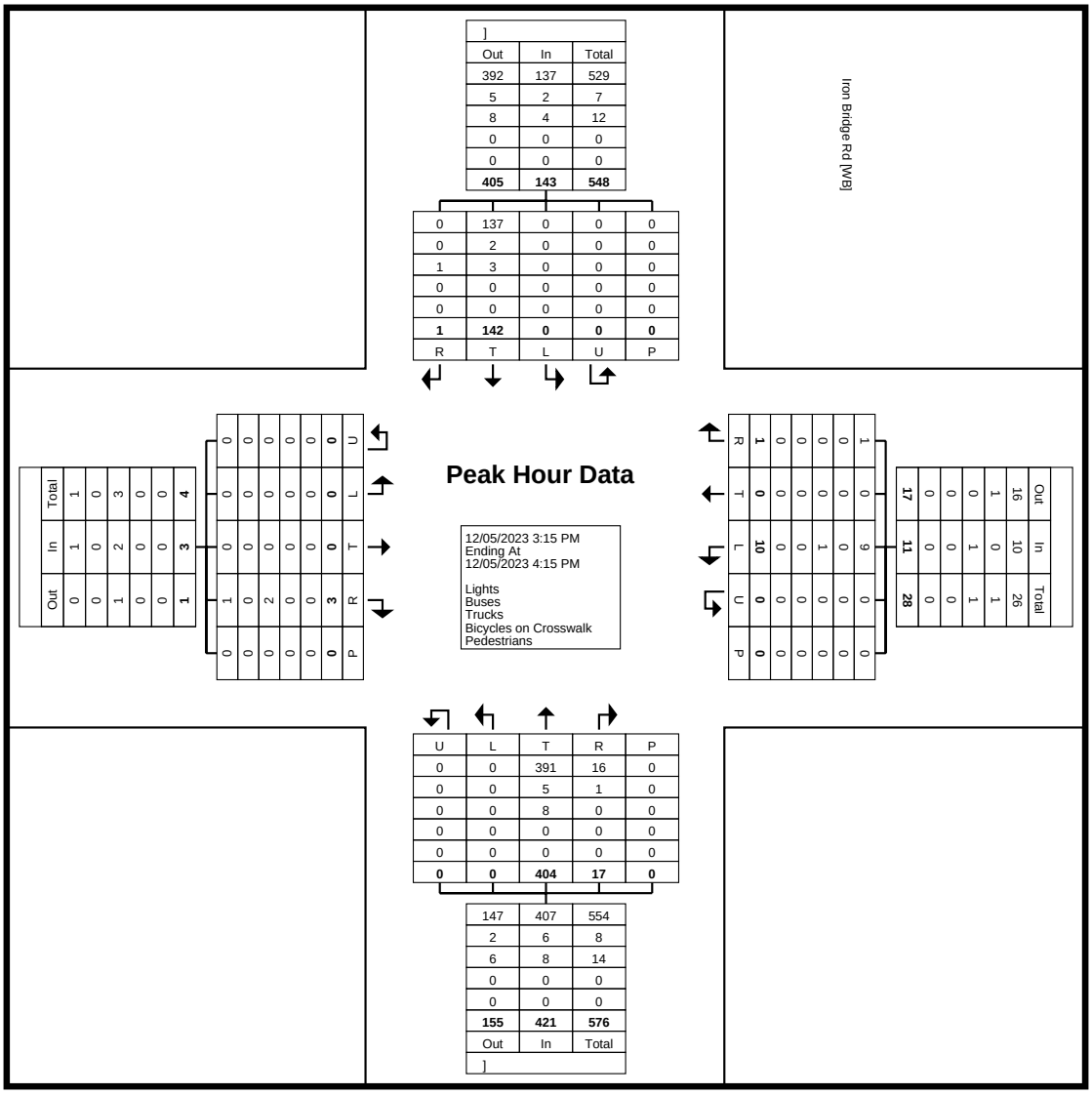
184 Baker Rd

Coatesville, Pennsylvania, United States 19320
610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Tuesday, December 5, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/05/2023
Page No: 9




| ] | | |
|---|---|---|
| Out | In | Total |
| 392 | 137 | 529 |
| 5 | 2 | 7 |
| 8 | 4 | 12 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **405** | **143** | **548** |

| | | | | |
|---|---|---|---|---|
| 0 | 137 | 0 | 0 | 0 |
| 0 | 2 | 0 | 0 | 0 |
| 1 | 3 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **1** | **142** | **0** | **0** | **0** |
| R | T | L | U | P |

| | | | | |
|---|---|---|---|---|
| U | L | T | R | P |
| 0 | 0 | 391 | 16 | 0 |
| 0 | 0 | 5 | 1 | 0 |
| 0 | 0 | 8 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **0** | **404** | **17** | **0** |

| | | |
|---|---|---|
| 147 | 407 | 554 |
| 2 | 6 | 8 |
| 6 | 8 | 14 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **155** | **421** | **576** |
| Out | In | Total |
| ] | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 1 | 0 | 3 | 0 | 0 | 0 | **4** |
| In | 1 | 0 | 2 | 0 | 0 | 0 | **3** |
| Out | 0 | 0 | 1 | 0 | 0 | 0 | **1** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | U |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | L |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | T |
| 1 | 0 | 0 | 2 | 0 | 0 | **3** | R |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R | **1** | 0 | 0 | 0 | 0 | 0 | 1 |
| T | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| L | **10** | 0 | 0 | 1 | 0 | 0 | 9 |
| U | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| P | **0** | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **17** | 0 | 0 | 0 | 1 | 16 | Out |
| **11** | 0 | 0 | 1 | 0 | 10 | In |
| **28** | 0 | 0 | 1 | 1 | 26 | Total |

Turning Movement Peak Hour Data Plot (3:15 PM)

www.TSTData.com
184 Baker Rd

Coatesville, Pennsylvania, United States 19320
610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Wednesday, December 6, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/06/2023


# Turning Movement Data

| Start Time | Eastbound St. Eastbound | | | | | | Westbound St. Westbound | | | | | | Northbound St. Northbound | | | | | | Southbound St. Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 19 | 0 | 0 | 0 | 19 | 1 | 70 | 1 | 0 | 0 | 72 | 94 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 27 | 0 | 0 | 0 | 27 | 0 | 85 | 0 | 0 | 0 | 85 | 114 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 68 | 0 | 0 | 0 | 68 | 86 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 31 | 2 | 0 | 0 | 33 | 0 | 80 | 0 | 0 | 0 | 80 | 121 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 15 | 0 | 93 | 2 | 0 | 0 | 95 | 1 | 303 | 1 | 0 | 0 | 305 | 415 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 22 | 1 | 0 | 0 | 23 | 0 | 68 | 0 | 0 | 0 | 68 | 95 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 22 | 1 | 0 | 0 | 23 | 0 | 93 | 0 | 0 | 0 | 93 | 118 |
| 7:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 33 | 2 | 1 | 0 | 38 | 0 | 97 | 0 | 0 | 0 | 97 | 140 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 21 | 0 | 0 | 0 | 21 | 0 | 59 | 0 | 0 | 0 | 59 | 84 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 14 | 0 | 0 | 0 | 0 | 14 | 2 | 98 | 4 | 1 | 0 | 105 | 0 | 317 | 0 | 0 | 0 | 317 | 437 |
| 8:00 AM | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 27 | 1 | 0 | 0 | 29 | 0 | 75 | 0 | 0 | 0 | 75 | 110 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 21 | 1 | 0 | 0 | 22 | 0 | 49 | 0 | 0 | 0 | 49 | 73 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 1 | 21 | 1 | 0 | 0 | 23 | 0 | 55 | 0 | 0 | 0 | 55 | 81 |
| 8:45 AM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 24 | 2 | 0 | 0 | 26 | 0 | 46 | 0 | 0 | 0 | 46 | 75 |
| Hourly Total | 0 | 0 | 2 | 0 | 0 | 2 | 11 | 0 | 1 | 0 | 0 | 12 | 2 | 93 | 5 | 0 | 0 | 100 | 0 | 225 | 0 | 0 | 0 | 225 | 339 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 29 | 1 | 1 | 0 | 32 | 0 | 40 | 0 | 0 | 0 | 40 | 73 |
| 9:15 AM | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 22 | 2 | 0 | 0 | 24 | 0 | 27 | 0 | 0 | 0 | 27 | 55 |
| 9:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 28 | 1 | 0 | 0 | 29 | 0 | 38 | 0 | 0 | 0 | 38 | 68 |
| 9:45 AM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 32 | 2 | 0 | 0 | 34 | 0 | 39 | 0 | 0 | 0 | 39 | 75 |
| Hourly Total | 0 | 0 | 3 | 0 | 0 | 3 | 4 | 0 | 1 | 0 | 0 | 5 | 1 | 111 | 6 | 1 | 0 | 119 | 0 | 144 | 0 | 0 | 0 | 144 | 271 |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 23 | 2 | 0 | 0 | 25 | 0 | 40 | 0 | 0 | 0 | 40 | 66 |
| 10:15 AM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 29 | 0 | 0 | 0 | 29 | 0 | 40 | 0 | 0 | 0 | 40 | 73 |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 39 | 0 | 0 | 0 | 39 | 76 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 2 | 0 | 0 | 25 | 0 | 33 | 0 | 0 | 0 | 33 | 58 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 110 | 5 | 0 | 0 | 115 | 0 | 152 | 0 | 0 | 0 | 152 | 273 |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 1 | 28 | 1 | 0 | 0 | 30 | 0 | 31 | 0 | 0 | 0 | 31 | 65 |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 35 | 3 | 0 | 0 | 38 | 0 | 32 | 0 | 0 | 0 | 32 | 71 |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 41 | 3 | 0 | 0 | 45 | 0 | 27 | 0 | 0 | 0 | 27 | 73 |
| 11:45 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 27 | 5 | 1 | 0 | 35 | 0 | 35 | 0 | 0 | 0 | 35 | 75 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 10 | 4 | 131 | 12 | 1 | 0 | 148 | 0 | 125 | 0 | 0 | 0 | 125 | 284 |
| 12:00 PM | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 31 | 3 | 0 | 0 | 35 | 0 | 29 | 0 | 0 | 0 | 29 | 68 |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 32 | 2 | 0 | 0 | 34 | 0 | 45 | 0 | 0 | 0 | 45 | 80 |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 36 | 0 | 0 | 0 | 36 | 74 |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 35 | 1 | 0 | 0 | 38 | 0 | 30 | 0 | 0 | 0 | 30 | 70 |
| Hourly Total | 0 | 0 | 2 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | 7 | 3 | 133 | 7 | 0 | 0 | 143 | 0 | 140 | 0 | 0 | 0 | 140 | 292 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 39 | 0 | 1 | 0 | 41 | 0 | 31 | 1 | 0 | 0 | 32 | 75 |
| 1:15 PM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 25 | 1 | 0 | 0 | 28 | 0 | 35 | 0 | 0 | 0 | 35 | 64 |
| 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 32 | 0 | 37 | 0 | 0 | 0 | 37 | 69 |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 1 | 33 | 0 | 0 | 0 | 34 | 0 | 36 | 0 | 0 | 0 | 36 | 78 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0 | 10 | 4 | 129 | 1 | 1 | 0 | 135 | 0 | 139 | 1 | 0 | 0 | 140 | 286 |
| 2:00 PM | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 35 | 2 | 0 | 0 | 37 | 0 | 36 | 0 | 0 | 0 | 36 | 78 |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 42 | 2 | 0 | 0 | 44 | 0 | 26 | 0 | 0 | 0 | 26 | 73 |
| 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 75 | 5 | 0 | 0 | 80 | 0 | 51 | 0 | 0 | 0 | 51 | 132 |
| 2:45 PM | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 67 | 0 | 0 | 0 | 67 | 0 | 21 | 0 | 0 | 0 | 21 | 92 |
| Hourly Total | 1 | 0 | 3 | 0 | 0 | 4 | 8 | 0 | 1 | 0 | 0 | 9 | 0 | 219 | 9 | 0 | 0 | 228 | 0 | 134 | 0 | 0 | 0 | 134 | 375 |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 6 | 0 | 0 | 78 | 0 | 22 | 0 | 0 | 0 | 22 | 100 |
| 3:15 PM | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 87 | 6 | 2 | 0 | 95 | 0 | 38 | 0 | 0 | 0 | 38 | 136 |
| 3:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 1 | 148 | 5 | 1 | 0 | 155 | 0 | 37 | 0 | 0 | 0 | 37 | 196 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 97 | 4 | 0 | 0 | 101 | 0 | 35 | 0 | 0 | 0 | 35 | 137 |
| Hourly Total | 0 | 0 | 3 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 404 | 21 | 3 | 0 | 429 | 0 | 132 | 0 | 0 | 0 | 132 | 569 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 2 | 1 | 0 | 103 | 0 | 40 | 0 | 0 | 0 | 40 | 143 |
| 4:15 PM | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 94 | 5 | 0 | 0 | 99 | 1 | 36 | 0 | 0 | 0 | 37 | 141 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 105 | 11 | 0 | 0 | 116 | 0 | 53 | 0 | 0 | 0 | 53 | 170 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 111 | 5 | 0 | 0 | 116 | 0 | 35 | 0 | 0 | 0 | 35 | 154 |
| Hourly Total | 1 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 410 | 23 | 1 | 0 | 434 | 1 | 164 | 0 | 0 | 0 | 165 | 608 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 85 | 2 | 0 | 0 | 87 | 0 | 46 | 0 | 0 | 0 | 46 | 135 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 70 | 6 | 0 | 0 | 76 | 0 | 32 | 0 | 0 | 0 | 32 | 109 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 68 | 1 | 0 | 0 | 69 | 0 | 28 | 0 | 0 | 0 | 28 | 98 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 48 | 2 | 0 | 0 | 50 | 0 | 26 | 0 | 0 | 0 | 26 | 77 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 5 | 0 | 271 | 11 | 0 | 0 | 282 | 0 | 132 | 0 | 0 | 0 | 132 | 419 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 31 | 3 | 0 | 0 | 34 | 0 | 32 | 0 | 0 | 0 | 32 | 67 |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 39 | 5 | 0 | 0 | 44 | 0 | 29 | 0 | 0 | 0 | 29 | 78 |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 32 | 0 | 0 | 0 | 32 | 0 | 19 | 0 | 0 | 0 | 19 | 55 |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 44 | 2 | 0 | 0 | 46 | 0 | 11 | 0 | 0 | 0 | 11 | 59 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 12 | 0 | 146 | 10 | 0 | 0 | 156 | 0 | 91 | 0 | 0 | 0 | 91 | 259 |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 30 | 2 | 0 | 0 | 32 | 0 | 13 | 0 | 0 | 0 | 13 | 47 |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 2 | 0 | 0 | 31 | 0 | 10 | 0 | 0 | 0 | 10 | 41 |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 28 | 1 | 0 | 0 | 29 | 0 | 12 | 0 | 0 | 0 | 12 | 42 |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 20 | 1 | 0 | 0 | 22 | 0 | 21 | 0 | 0 | 0 | 21 | 44 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 1 | 107 | 6 | 0 | 0 | 114 | 0 | 56 | 0 | 0 | 0 | 56 | 174 |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 3 | 0 | 0 | 28 | 0 | 18 | 0 | 0 | 0 | 18 | 46 |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 1 | 0 | 0 | 27 | 0 | 13 | 0 | 0 | 0 | 13 | 40 |
| 8:30 PM | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 23 | 5 | 0 | 0 | 28 | 0 | 8 | 0 | 0 | 0 | 8 | 38 |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 4 | 0 | 0 | 21 | 0 | 9 | 0 | 0 | 0 | 9 | 30 |
| Hourly Total | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 91 | 13 | 0 | 0 | 104 | 0 | 48 | 0 | 0 | 0 | 48 | 154 |
| Grand Total | 3 | 0 | 17 | 0 | 0 | 20 | 117 | 0 | 5 | 0 | 0 | 122 | 18 | 2546 | 135 | 8 | 0 | 2707 | 2 | 2302 | 2 | 0 | 0 | 2306 | 5155 |
| Approach % | 15.0 | 0.0 | 85.0 | 0.0 | - | - | 95.9 | 0.0 | 4.1 | 0.0 | - | - | 0.7 | 94.1 | 5.0 | 0.3 | - | - | 0.1 | 99.8 | 0.1 | 0.0 | - | - | - |
| Total % | 0.1 | 0.0 | 0.3 | 0.0 | - | 0.4 | 2.3 | 0.0 | 0.1 | 0.0 | - | 2.4 | 0.3 | 49.4 | 2.6 | 0.2 | - | 52.5 | 0.0 | 44.7 | 0.0 | 0.0 | - | 44.7 | - |
| Lights | 0 | 0 | 5 | 0 | - | 5 | 111 | 0 | 5 | 0 | - | 116 | 2 | 2394 | 129 | 8 | - | 2533 | 2 | 2116 | 1 | 0 | - | 2119 | 4773 |
| % Lights | 0.0 | - | 29.4 | - | - | 25.0 | 94.9 | - | 100.0 | - | - | 95.1 | 11.1 | 94.0 | 95.6 | 100.0 | - | 93.6 | 100.0 | 91.9 | 50.0 | - | - | 91.9 | 92.6 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | 0 | - | 2 | 0 | 20 | 4 | 0 | - | 24 | 0 | 22 | 0 | 0 | - | 22 | 48 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | 1.7 | - | 0.0 | - | - | 1.6 | 0.0 | 0.8 | 3.0 | 0.0 | - | 0.9 | 0.0 | 1.0 | 0.0 | - | - | 1.0 | 0.9 |
| Trucks | 3 | 0 | 12 | 0 | - | 15 | 4 | 0 | 0 | 0 | - | 4 | 16 | 132 | 2 | 0 | - | 150 | 0 | 164 | 1 | 0 | - | 165 | 334 |
| % Trucks | 100.0 | - | 70.6 | - | - | 75.0 | 3.4 | - | 0.0 | - | - | 3.3 | 88.9 | 5.2 | 1.5 | 0.0 | - | 5.5 | 0.0 | 7.1 | 50.0 | - | - | 7.2 | 6.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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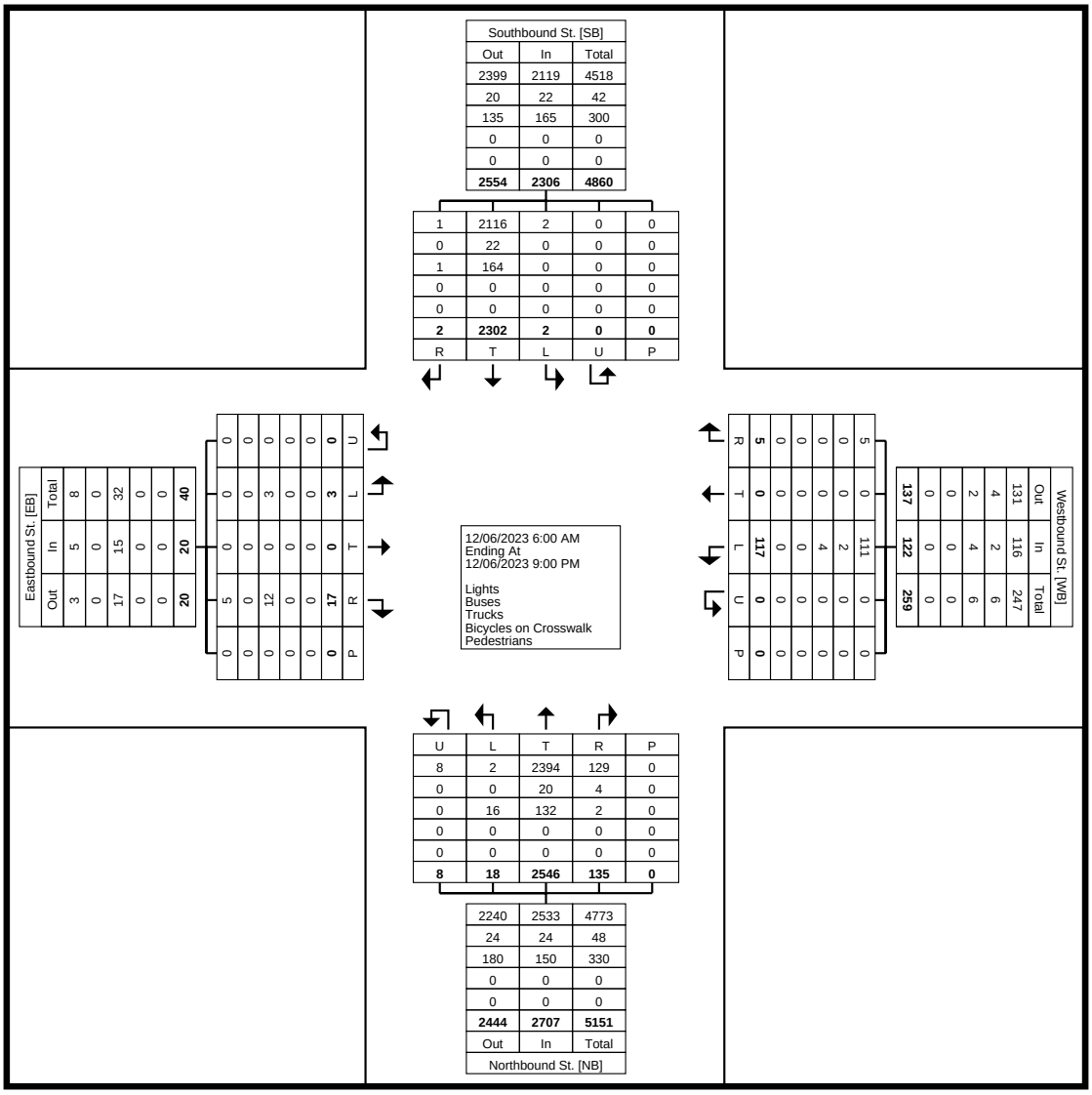
Cumberland County, PA
Wednesday, December 6, 2023
Location: 40.035378, -77.645544

Count Name: Rd
Site Code:
Start Date: 12/06/2023


Turning Movement Data Plot

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Serving Transportation Professionals Since 1995

Cumberland County, PA
Wednesday, December 6, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/06/2023


# Turning Movement Peak Hour Data (6:45 AM)

| Start Time | Eastbound St. Eastbound | | | | | | Westbound St. Westbound | | | | | | Northbound St. Northbound | | | | | | Southbound St. Southbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 31 | 2 | 0 | 0 | 33 | 0 | 80 | 0 | 0 | 0 | 80 | 121 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 22 | 1 | 0 | 0 | 23 | 0 | 68 | 0 | 0 | 0 | 68 | 95 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 22 | 1 | 0 | 0 | 23 | 0 | 93 | 0 | 0 | 0 | 93 | 118 |
| 7:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 33 | 2 | 1 | 0 | 38 | 0 | 97 | 0 | 0 | 0 | 97 | 140 |
| Total | 0 | 0 | 1 | 0 | 0 | 1 | 18 | 0 | 0 | 0 | 0 | 18 | 2 | 108 | 6 | 1 | 0 | 117 | 0 | 338 | 0 | 0 | 0 | 338 | 474 |
| Approach % | 0.0 | 0.0 | 100.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 1.7 | 92.3 | 5.1 | 0.9 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.2 | 0.0 | - | 0.2 | 3.8 | 0.0 | 0.0 | 0.0 | - | 3.8 | 0.4 | 22.8 | 1.3 | 0.2 | - | 24.7 | 0.0 | 71.3 | 0.0 | 0.0 | - | 71.3 | - |
| PHF | 0.000 | 0.000 | 0.250 | 0.000 | - | 0.250 | 0.563 | 0.000 | 0.000 | 0.000 | - | 0.563 | 0.250 | 0.818 | 0.750 | 0.250 | - | 0.770 | 0.000 | 0.871 | 0.000 | 0.000 | - | 0.871 | 0.846 |
| Lights | 0 | 0 | 1 | 0 | - | 1 | 17 | 0 | 0 | 0 | - | 17 | 1 | 96 | 6 | 1 | - | 104 | 0 | 310 | 0 | 0 | - | 310 | 432 |
| % Lights | - | - | 100.0 | - | - | 100.0 | 94.4 | - | - | - | - | 94.4 | 50.0 | 88.9 | 100.0 | 100.0 | - | 88.9 | - | 91.7 | - | - | - | 91.7 | 91.1 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 0 | 3 | 0 | 0 | - | 3 | 0 | 8 | 0 | 0 | - | 8 | 12 |
| % Buses | - | - | 0.0 | - | - | 0.0 | 5.6 | - | - | - | - | 5.6 | 0.0 | 2.8 | 0.0 | 0.0 | - | 2.6 | - | 2.4 | - | - | - | 2.4 | 2.5 |
| Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 9 | 0 | 0 | - | 10 | 0 | 20 | 0 | 0 | - | 20 | 30 |
| % Trucks | - | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 50.0 | 8.3 | 0.0 | 0.0 | - | 8.5 | - | 5.9 | - | - | - | 5.9 | 6.3 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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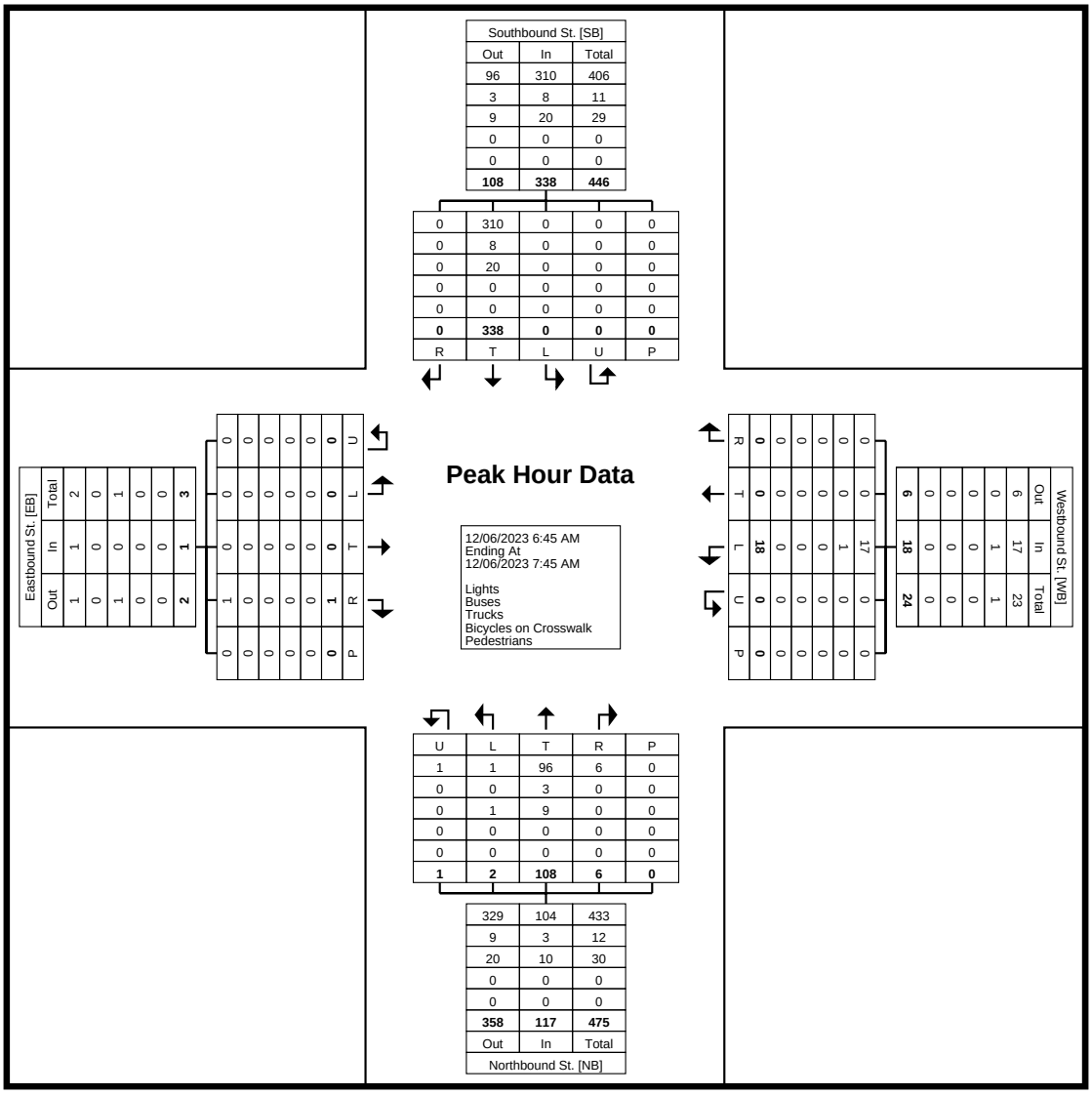
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/06/2023


Turning Movement Peak Hour Data Plot (6:45 AM)

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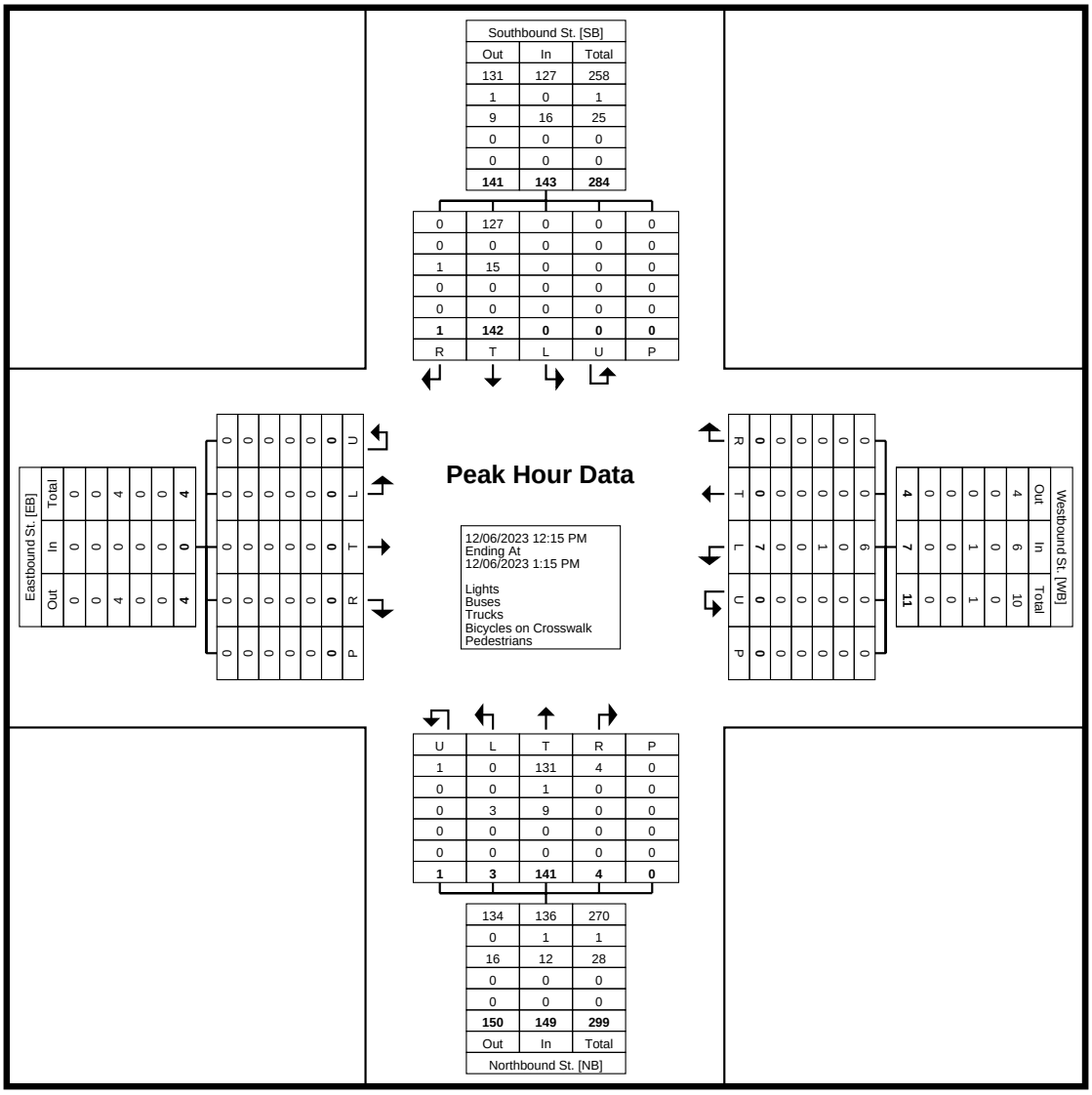
Cumberland County, PA
Wednesday, December 6, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/06/2023


# Turning Movement Peak Hour Data (12:15 PM)

| Start Time | Eastbound St. Eastbound | | | | | | Westbound St. Westbound | | | | | | Northbound St. Northbound | | | | | | Southbound St. Southbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 32 | 2 | 0 | 0 | 34 | 0 | 45 | 0 | 0 | 0 | 45 | 80 |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 36 | 0 | 0 | 0 | 36 | 74 |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 35 | 1 | 0 | 0 | 38 | 0 | 30 | 0 | 0 | 0 | 30 | 70 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 39 | 0 | 1 | 0 | 41 | 0 | 31 | 1 | 0 | 0 | 32 | 75 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 3 | 141 | 4 | 1 | 0 | 149 | 0 | 142 | 1 | 0 | 0 | 143 | 299 |
| Approach % | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 2.0 | 94.6 | 2.7 | 0.7 | - | - | 0.0 | 99.3 | 0.7 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | - | 2.3 | 1.0 | 47.2 | 1.3 | 0.3 | - | 49.8 | 0.0 | 47.5 | 0.3 | 0.0 | - | 47.8 | - |
| PHF | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.875 | 0.000 | 0.000 | 0.000 | - | 0.875 | 0.375 | 0.904 | 0.500 | 0.250 | - | 0.909 | 0.000 | 0.789 | 0.250 | 0.000 | - | 0.794 | 0.934 |
| Lights | 0 | 0 | 0 | 0 | - | 0 | 6 | 0 | 0 | 0 | - | 6 | 0 | 131 | 4 | 1 | - | 136 | 0 | 127 | 0 | 0 | - | 127 | 269 |
| % Lights | - | - | - | - | - | - | 85.7 | - | - | - | - | 85.7 | 0.0 | 92.9 | 100.0 | 100.0 | - | 91.3 | - | 89.4 | 0.0 | - | - | 88.8 | 90.0 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Buses | - | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | - | 0.7 | - | 0.0 | 0.0 | - | - | 0.0 | 0.3 |
| Trucks | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | 1 | 3 | 9 | 0 | 0 | - | 12 | 0 | 15 | 1 | 0 | - | 16 | 29 |
| % Trucks | - | - | - | - | - | - | 14.3 | - | - | - | - | 14.3 | 100.0 | 6.4 | 0.0 | 0.0 | - | 8.1 | - | 10.6 | 100.0 | - | - | 11.2 | 9.7 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




Turning Movement Peak Hour Data Plot (12:15 PM)

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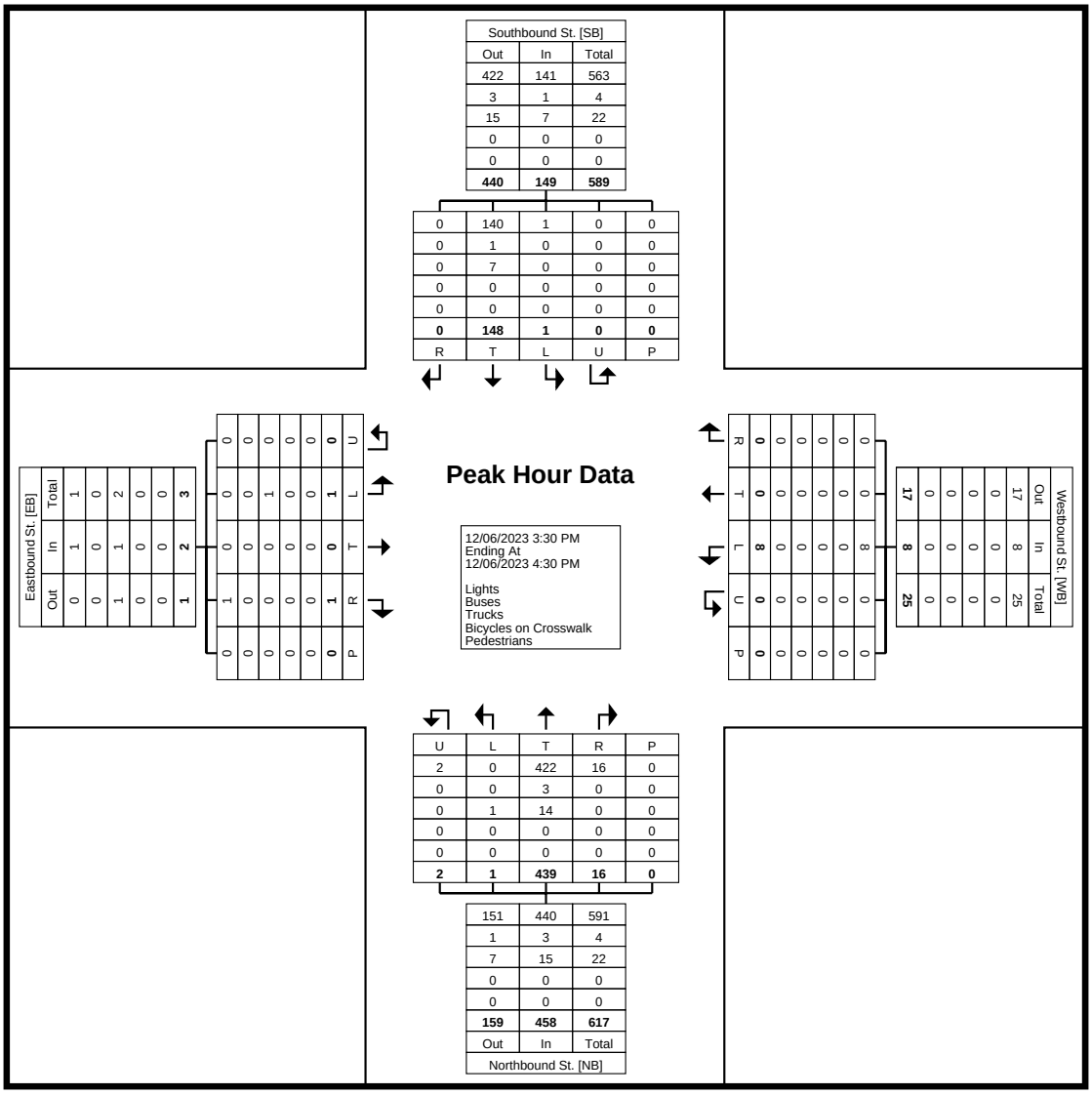
Cumberland County, PA Rd
Wednesday, December 6, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/06/2023


# Turning Movement Peak Hour Data (3:30 PM)

| Start Time | Eastbound St. Eastbound | | | | | | Westbound St. Westbound | | | | | | Northbound St. Northbound | | | | | | Southbound St. Southbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 3:30 PM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 1 | 148 | 5 | 1 | 0 | 155 | 0 | 37 | 0 | 0 | 0 | 37 | 196 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 97 | 4 | 0 | 0 | 101 | 0 | 35 | 0 | 0 | 0 | 35 | 137 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 2 | 1 | 0 | 103 | 0 | 40 | 0 | 0 | 0 | 40 | 143 |
| 4:15 PM | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 94 | 5 | 0 | 0 | 99 | 1 | 36 | 0 | 0 | 0 | 37 | 141 |
| Total | 1 | 0 | 1 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 0 | 8 | 1 | 439 | 16 | 2 | 0 | 458 | 1 | 148 | 0 | 0 | 0 | 149 | 617 |
| Approach % | 50.0 | 0.0 | 50.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 0.2 | 95.9 | 3.5 | 0.4 | - | - | 0.7 | 99.3 | 0.0 | 0.0 | - | - | - |
| Total % | 0.2 | 0.0 | 0.2 | 0.0 | - | 0.3 | 1.3 | 0.0 | 0.0 | 0.0 | - | 1.3 | 0.2 | 71.2 | 2.6 | 0.3 | - | 74.2 | 0.2 | 24.0 | 0.0 | 0.0 | - | 24.1 | - |
| PHF | 0.250 | 0.000 | 0.250 | 0.000 | - | 0.500 | 0.500 | 0.000 | 0.000 | 0.000 | - | 0.500 | 0.250 | 0.742 | 0.800 | 0.500 | - | 0.739 | 0.250 | 0.925 | 0.000 | 0.000 | - | 0.931 | 0.787 |
| Lights | 0 | 0 | 1 | 0 | - | 1 | 8 | 0 | 0 | 0 | - | 8 | 0 | 422 | 16 | 2 | - | 440 | 1 | 140 | 0 | 0 | - | 141 | 590 |
| % Lights | 0.0 | - | 100.0 | - | - | 50.0 | 100.0 | - | - | - | - | 100.0 | 0.0 | 96.1 | 100.0 | 100.0 | - | 96.1 | 100.0 | 94.6 | - | - | - | 94.6 | 95.6 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 3 | 0 | 0 | - | 3 | 0 | 1 | 0 | 0 | - | 1 | 4 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | - | 0.7 | 0.0 | 0.7 | - | - | - | 0.7 | 0.6 |
| Trucks | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 | 14 | 0 | 0 | - | 15 | 0 | 7 | 0 | 0 | - | 7 | 23 |
| % Trucks | 100.0 | - | 0.0 | - | - | 50.0 | 0.0 | - | - | - | - | 0.0 | 100.0 | 3.2 | 0.0 | 0.0 | - | 3.3 | 0.0 | 4.7 | - | - | - | 4.7 | 3.7 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




Turning Movement Peak Hour Data Plot (3:30 PM)

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Cumberland County, PA
Thursday, December 7, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/07/2023

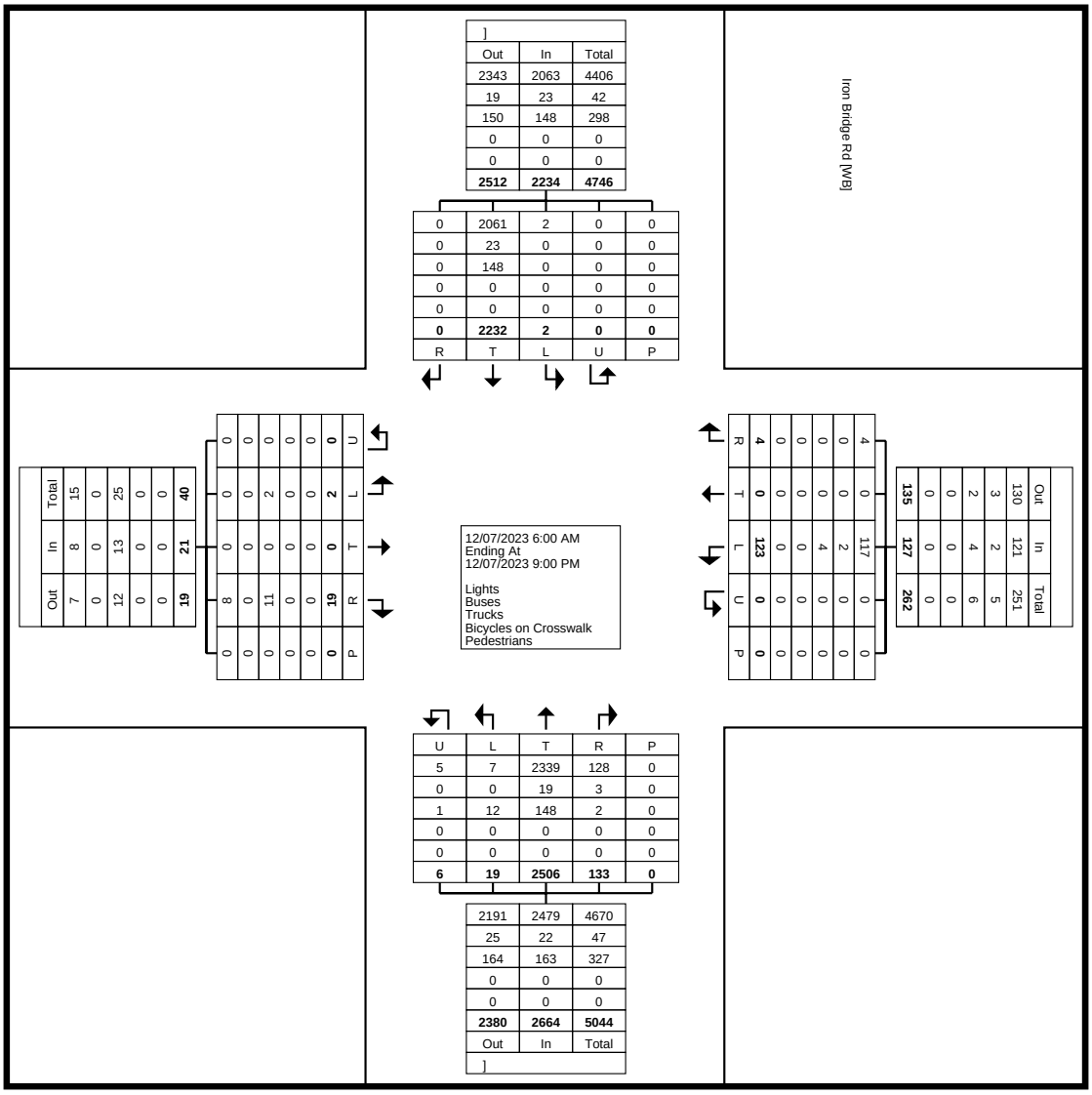

# Turning Movement Data

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 19 | 0 | 0 | 0 | 20 | 2 | 72 | 0 | 0 | 0 | 74 | 96 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 9 | 0 | 0 | 0 | 9 | 0 | 66 | 0 | 0 | 0 | 66 | 78 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 18 | 1 | 0 | 0 | 20 | 0 | 70 | 0 | 0 | 0 | 70 | 92 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 7 | 1 | 20 | 2 | 0 | 0 | 23 | 0 | 81 | 0 | 0 | 0 | 81 | 111 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 14 | 3 | 66 | 3 | 0 | 0 | 72 | 2 | 289 | 0 | 0 | 0 | 291 | 377 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 11 | 1 | 16 | 1 | 0 | 0 | 18 | 0 | 64 | 0 | 0 | 0 | 64 | 93 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 22 | 1 | 0 | 0 | 24 | 0 | 97 | 0 | 0 | 0 | 97 | 126 |
| 7:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 35 | 0 | 0 | 0 | 37 | 0 | 81 | 0 | 0 | 0 | 81 | 122 |
| 7:45 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 29 | 1 | 0 | 0 | 32 | 0 | 82 | 0 | 0 | 0 | 82 | 119 |
| Hourly Total | 0 | 0 | 2 | 0 | 0 | 2 | 23 | 0 | 0 | 0 | 0 | 23 | 6 | 102 | 3 | 0 | 0 | 111 | 0 | 324 | 0 | 0 | 0 | 324 | 460 |
| 8:00 AM | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 26 | 2 | 1 | 0 | 30 | 0 | 65 | 0 | 0 | 0 | 65 | 99 |
| 8:15 AM | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 19 | 0 | 0 | 0 | 20 | 0 | 54 | 0 | 0 | 0 | 54 | 76 |
| 8:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 20 | 4 | 1 | 0 | 25 | 0 | 54 | 0 | 0 | 0 | 54 | 81 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 23 | 1 | 1 | 0 | 26 | 0 | 33 | 0 | 0 | 0 | 33 | 60 |
| Hourly Total | 0 | 0 | 4 | 0 | 0 | 4 | 5 | 0 | 0 | 0 | 0 | 5 | 3 | 88 | 7 | 3 | 0 | 101 | 0 | 206 | 0 | 0 | 0 | 206 | 316 |
| 9:00 AM | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 35 | 2 | 0 | 0 | 37 | 0 | 40 | 0 | 0 | 0 | 40 | 79 |
| 9:15 AM | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 34 | 0 | 0 | 0 | 34 | 0 | 48 | 0 | 0 | 0 | 48 | 88 |
| 9:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 25 | 2 | 0 | 0 | 27 | 0 | 42 | 0 | 0 | 0 | 42 | 70 |
| 9:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 29 | 0 | 46 | 0 | 0 | 0 | 46 | 75 |
| Hourly Total | 0 | 0 | 2 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 123 | 4 | 0 | 0 | 127 | 0 | 176 | 0 | 0 | 0 | 176 | 312 |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 1 | 25 | 2 | 0 | 0 | 28 | 0 | 31 | 0 | 0 | 0 | 31 | 62 |
| 10:15 AM | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 26 | 1 | 1 | 0 | 29 | 0 | 26 | 0 | 0 | 0 | 26 | 57 |
| 10:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 23 | 0 | 0 | 0 | 23 | 57 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 21 | 2 | 0 | 0 | 23 | 0 | 44 | 0 | 0 | 0 | 44 | 70 |
| Hourly Total | 0 | 0 | 2 | 0 | 0 | 2 | 10 | 0 | 0 | 0 | 0 | 10 | 2 | 102 | 5 | 1 | 0 | 110 | 0 | 124 | 0 | 0 | 0 | 124 | 246 |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 27 | 5 | 0 | 0 | 32 | 0 | 28 | 0 | 0 | 0 | 28 | 63 |
| 11:15 AM | 0 | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 44 | 3 | 1 | 0 | 48 | 0 | 36 | 0 | 0 | 0 | 36 | 89 |
| 11:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 23 | 1 | 0 | 0 | 24 | 0 | 35 | 0 | 0 | 0 | 35 | 64 |
| 11:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 45 | 0 | 0 | 0 | 45 | 0 | 25 | 0 | 0 | 0 | 25 | 71 |
| Hourly Total | 0 | 0 | 3 | 0 | 0 | 3 | 9 | 0 | 2 | 0 | 0 | 11 | 0 | 139 | 9 | 1 | 0 | 149 | 0 | 124 | 0 | 0 | 0 | 124 | 287 |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 34 | 3 | 0 | 0 | 37 | 0 | 23 | 0 | 0 | 0 | 23 | 62 |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 35 | 1 | 0 | 0 | 36 | 0 | 39 | 0 | 0 | 0 | 39 | 78 |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 2 | 0 | 0 | 46 | 0 | 33 | 0 | 0 | 0 | 33 | 79 |
| 12:45 PM | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 43 | 1 | 0 | 0 | 45 | 0 | 37 | 0 | 0 | 0 | 37 | 85 |
| Hourly Total | 0 | 0 | 2 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 6 | 1 | 156 | 7 | 0 | 0 | 164 | 0 | 132 | 0 | 0 | 0 | 132 | 304 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 2 | 0 | 0 | 38 | 0 | 31 | 0 | 0 | 0 | 31 | 69 |
| 1:15 PM | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 2 | 0 | 0 | 45 | 0 | 36 | 0 | 0 | 0 | 36 | 83 |
| 1:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 27 | 2 | 0 | 0 | 29 | 0 | 33 | 0 | 0 | 0 | 33 | 64 |
| 1:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 40 | 4 | 0 | 0 | 44 | 0 | 32 | 0 | 0 | 0 | 32 | 77 |
| Hourly Total | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 146 | 10 | 0 | 0 | 156 | 0 | 132 | 0 | 0 | 0 | 132 | 293 |
| 2:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 49 | 2 | 0 | 0 | 51 | 0 | 30 | 0 | 0 | 0 | 30 | 84 |
| 2:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 89 | 1 | 0 | 0 | 90 | 0 | 37 | 0 | 0 | 0 | 37 | 131 |
| 2:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 92 | 3 | 0 | 0 | 95 | 0 | 24 | 0 | 0 | 0 | 24 | 123 |
| 2:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 53 | 5 | 0 | 0 | 58 | 0 | 31 | 0 | 0 | 0 | 31 | 90 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | 12 | 0 | 283 | 11 | 0 | 0 | 294 | 0 | 122 | 0 | 0 | 0 | 122 | 428 |
| 3:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 72 | 1 | 0 | 0 | 73 | 0 | 24 | 0 | 0 | 0 | 24 | 98 |
| 3:15 PM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 3 | 1 | 65 | 5 | 0 | 0 | 71 | 0 | 38 | 0 | 0 | 0 | 38 | 113 |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 146 | 5 | 0 | 0 | 152 | 0 | 36 | 0 | 0 | 0 | 36 | 190 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 87 | 4 | 1 | 0 | 93 | 0 | 30 | 0 | 0 | 0 | 30 | 123 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 0 | 1 | 0 | 0 | 6 | 3 | 370 | 15 | 1 | 0 | 389 | 0 | 128 | 0 | 0 | 0 | 128 | 524 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 4 | 0 | 0 | 99 | 0 | 32 | 0 | 0 | 0 | 32 | 131 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 78 | 2 | 0 | 0 | 80 | 0 | 36 | 0 | 0 | 0 | 36 | 117 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 94 | 4 | 0 | 0 | 98 | 0 | 43 | 0 | 0 | 0 | 43 | 145 |
| 4:45 PM | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 70 | 6 | 0 | 0 | 76 | 0 | 33 | 0 | 0 | 0 | 33 | 112 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 337 | 16 | 0 | 0 | 353 | 0 | 144 | 0 | 0 | 0 | 144 | 505 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 78 | 6 | 0 | 0 | 84 | 0 | 45 | 0 | 0 | 0 | 45 | 130 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 62 | 2 | 0 | 0 | 65 | 0 | 34 | 0 | 0 | 0 | 34 | 101 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 59 | 4 | 0 | 0 | 63 | 0 | 35 | 0 | 0 | 0 | 35 | 101 |
| 5:45 PM | 1 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 36 | 8 | 0 | 0 | 44 | 0 | 47 | 0 | 0 | 0 | 47 | 97 |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hourly Total | 1 | 0 | 0 | 0 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 11 | 1 | 235 | 20 | 0 | 0 | 256 | 0 | 161 | 0 | 0 | 0 | 161 | 429 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 34 | 1 | 0 | 0 | 35 | 0 | 26 | 0 | 0 | 0 | 26 | 63 |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 50 | 4 | 0 | 0 | 54 | 0 | 25 | 0 | 0 | 0 | 25 | 82 |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 39 | 3 | 0 | 0 | 42 | 0 | 20 | 0 | 0 | 0 | 20 | 66 |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 1 | 0 | 0 | 24 | 0 | 13 | 0 | 0 | 0 | 13 | 37 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0 | 146 | 9 | 0 | 0 | 155 | 0 | 84 | 0 | 0 | 0 | 84 | 248 |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 23 | 4 | 0 | 0 | 27 | 0 | 8 | 0 | 0 | 0 | 8 | 36 |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 46 | 3 | 0 | 0 | 49 | 0 | 17 | 0 | 0 | 0 | 17 | 67 |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 17 | 0 | 0 | 0 | 17 | 36 |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 1 | 0 | 0 | 26 | 0 | 8 | 0 | 0 | 0 | 8 | 34 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 113 | 8 | 0 | 0 | 121 | 0 | 50 | 0 | 0 | 0 | 50 | 173 |
| 8:00 PM | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 3 | 0 | 0 | 24 | 0 | 13 | 0 | 0 | 0 | 13 | 38 |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 34 | 0 | 2 | 0 | 0 | 0 | 2 | 36 |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 24 | 1 | 0 | 0 | 25 | 0 | 14 | 0 | 0 | 0 | 14 | 40 |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 2 | 0 | 0 | 23 | 0 | 7 | 0 | 0 | 0 | 7 | 30 |
| Hourly Total | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 100 | 6 | 0 | 0 | 106 | 0 | 36 | 0 | 0 | 0 | 36 | 144 |
| Grand Total | 2 | 0 | 19 | 0 | 0 | 21 | 123 | 0 | 4 | 0 | 0 | 127 | 19 | 2506 | 133 | 6 | 0 | 2664 | 2 | 2232 | 0 | 0 | 0 | 2234 | 5046 |
| Approach % | 9.5 | 0.0 | 90.5 | 0.0 | - | - | 96.9 | 0.0 | 3.1 | 0.0 | - | - | 0.7 | 94.1 | 5.0 | 0.2 | - | - | 0.1 | 99.9 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.4 | 0.0 | - | 0.4 | 2.4 | 0.0 | 0.1 | 0.0 | - | 2.5 | 0.4 | 49.7 | 2.6 | 0.1 | - | 52.8 | 0.0 | 44.2 | 0.0 | 0.0 | - | 44.3 | - |
| Lights | 0 | 0 | 8 | 0 | - | 8 | 117 | 0 | 4 | 0 | - | 121 | 7 | 2339 | 128 | 5 | - | 2479 | 2 | 2061 | 0 | 0 | - | 2063 | 4671 |
| % Lights | 0.0 | - | 42.1 | - | - | 38.1 | 95.1 | - | 100.0 | - | - | 95.3 | 36.8 | 93.3 | 96.2 | 83.3 | - | 93.1 | 100.0 | 92.3 | - | - | - | 92.3 | 92.6 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 2 | 0 | 0 | 0 | - | 2 | 0 | 19 | 3 | 0 | - | 22 | 0 | 23 | 0 | 0 | - | 23 | 47 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | 1.6 | - | 0.0 | - | - | 1.6 | 0.0 | 0.8 | 2.3 | 0.0 | - | 0.8 | 0.0 | 1.0 | - | - | - | 1.0 | 0.9 |
| Trucks | 2 | 0 | 11 | 0 | - | 13 | 4 | 0 | 0 | 0 | - | 4 | 12 | 148 | 2 | 1 | - | 163 | 0 | 148 | 0 | 0 | - | 148 | 328 |
| % Trucks | 100.0 | - | 57.9 | - | - | 61.9 | 3.3 | - | 0.0 | - | - | 3.1 | 63.2 | 5.9 | 1.5 | 16.7 | - | 6.1 | 0.0 | 6.6 | - | - | - | 6.6 | 6.5 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Cumberland County, PA
Thursday, December 7, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/07/2023


Turning Movement Data Plot

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610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Thursday, December 7, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/07/2023


# Turning Movement Peak Hour Data (7:15 AM)

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 1 | 22 | 1 | 0 | 0 | 24 | 0 | 97 | 0 | 0 | 0 | 97 | 126 |
| 7:30 AM | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 35 | 0 | 0 | 0 | 37 | 0 | 81 | 0 | 0 | 0 | 81 | 122 |
| 7:45 AM | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 2 | 29 | 1 | 0 | 0 | 32 | 0 | 82 | 0 | 0 | 0 | 82 | 119 |
| 8:00 AM | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 26 | 2 | 1 | 0 | 30 | 0 | 65 | 0 | 0 | 0 | 65 | 99 |
| Total | 0 | 0 | 4 | 0 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 14 | 6 | 112 | 4 | 1 | 0 | 123 | 0 | 325 | 0 | 0 | 0 | 325 | 466 |
| Approach % | 0.0 | 0.0 | 100.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 4.9 | 91.1 | 3.3 | 0.8 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.9 | 0.0 | - | 0.9 | 3.0 | 0.0 | 0.0 | 0.0 | - | 3.0 | 1.3 | 24.0 | 0.9 | 0.2 | - | 26.4 | 0.0 | 69.7 | 0.0 | 0.0 | - | 69.7 | - |
| PHF | 0.000 | 0.000 | 0.500 | 0.000 | - | 0.500 | 0.700 | 0.000 | 0.000 | 0.000 | - | 0.700 | 0.750 | 0.800 | 0.500 | 0.250 | - | 0.831 | 0.000 | 0.838 | 0.000 | 0.000 | - | 0.838 | 0.925 |
| Lights | 0 | 0 | 1 | 0 | - | 1 | 14 | 0 | 0 | 0 | - | 14 | 3 | 98 | 3 | 1 | - | 105 | 0 | 311 | 0 | 0 | - | 311 | 431 |
| % Lights | - | - | 25.0 | - | - | 25.0 | 100.0 | - | - | - | - | 100.0 | 50.0 | 87.5 | 75.0 | 100.0 | - | 85.4 | - | 95.7 | - | - | - | 95.7 | 92.5 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 5 | 1 | 0 | - | 6 | 0 | 1 | 0 | 0 | - | 1 | 7 |
| % Buses | - | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 | 4.5 | 25.0 | 0.0 | - | 4.9 | - | 0.3 | - | - | - | 0.3 | 1.5 |
| Trucks | 0 | 0 | 3 | 0 | - | 3 | 0 | 0 | 0 | 0 | - | 0 | 3 | 9 | 0 | 0 | - | 12 | 0 | 13 | 0 | 0 | - | 13 | 28 |
| % Trucks | - | - | 75.0 | - | - | 75.0 | 0.0 | - | - | - | - | 0.0 | 50.0 | 8.0 | 0.0 | 0.0 | - | 9.8 | - | 4.0 | - | - | - | 4.0 | 6.0 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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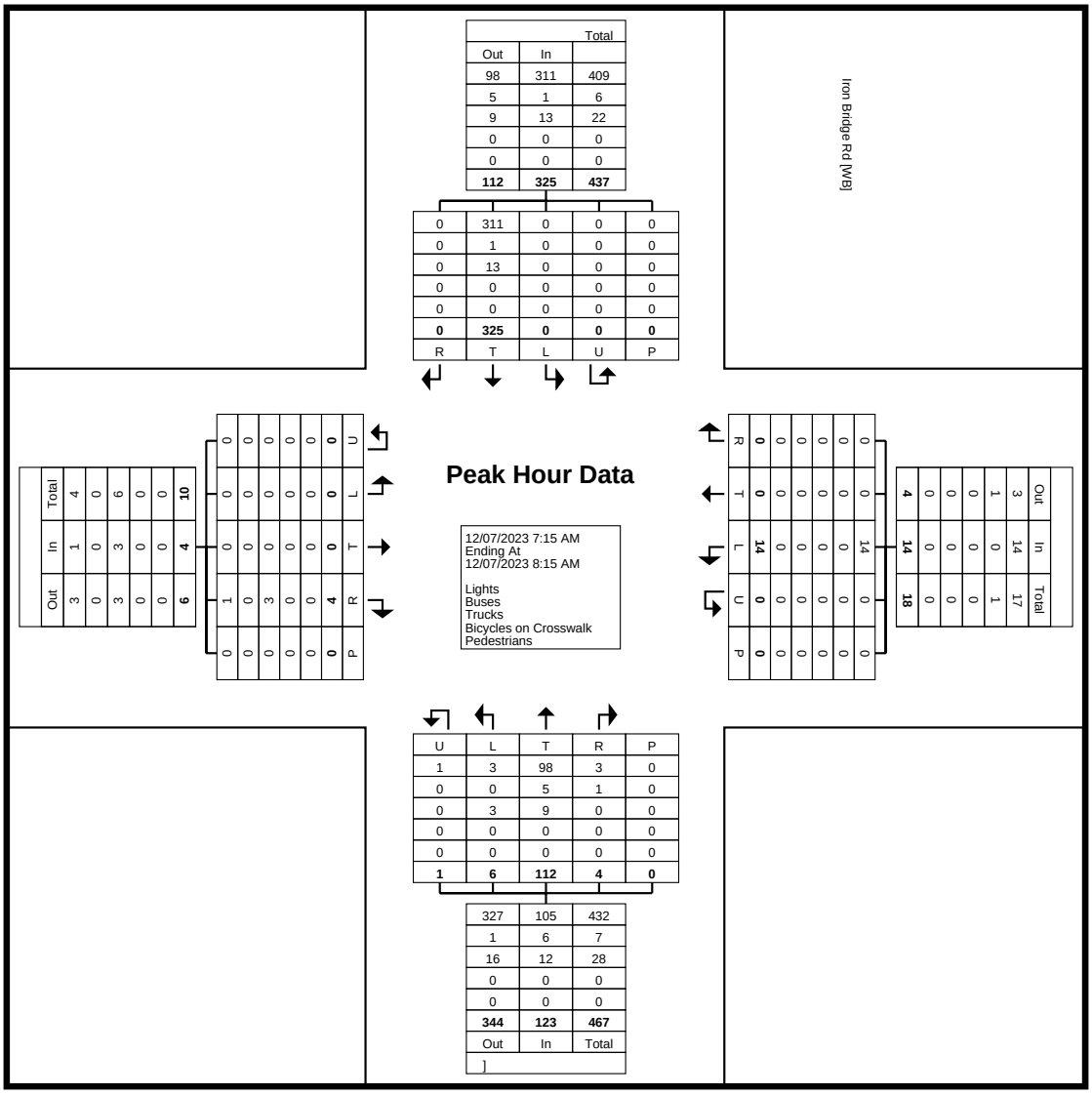
Cumberland County, PA
Thursday, December 7, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/07/2023


| | | Total |
|---|---|---|
| Out | In | |
| 98 | 311 | 409 |
| 5 | 1 | 6 |
| 9 | 13 | 22 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **112** | **325** | **437** |

| | | | | |
|---|---|---|---|---|
| 0 | 311 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 13 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **325** | **0** | **0** | **0** |
| R | T | L | U | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | U |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | L |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | T |
| 1 | 0 | 0 | 3 | 0 | 0 | **4** | R |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 4 | 0 | 6 | 0 | 0 | 0 | **10** |
| In | 1 | 0 | 3 | 0 | 0 | 0 | **4** |
| Out | 3 | 0 | 3 | 0 | 0 | 0 | **6** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| T | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| L | **14** | 0 | 0 | 0 | 0 | 14 | 0 |
| U | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| P | **0** | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **4** | 0 | 0 | 0 | 1 | 3 | Out | |
| **14** | 0 | 0 | 0 | 0 | 14 | In | |
| **18** | 0 | 0 | 0 | 1 | 17 | Total | |

| | | | | |
|---|---|---|---|---|
| U | L | T | R | P |
| 1 | 3 | 98 | 3 | 0 |
| 0 | 0 | 5 | 1 | 0 |
| 0 | 3 | 9 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **1** | **6** | **112** | **4** | **0** |

| | | |
|---|---|---|
| 327 | 105 | 432 |
| 1 | 6 | 7 |
| 16 | 12 | 28 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **344** | **123** | **467** |
| Out | In | Total |

]

Turning Movement Peak Hour Data Plot (7:15 AM)

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184 Baker Rd

Coatesville, Pennsylvania, United States 19320
610-466-1469 TSTData@aol.com
Serving Transportation Professionals Since 1995

Cumberland County, PA
Thursday, December 7, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/07/2023


# Turning Movement Peak Hour Data (12:30 PM)

| Start Time | Eastbound | | | | | | Westbound | | | | | | Northbound | | | | | | Southbound | | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 2 | 0 | 0 | 46 | 0 | 33 | 0 | 0 | 0 | 33 | 79 |
| 12:45 PM | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 43 | 1 | 0 | 0 | 45 | 0 | 37 | 0 | 0 | 0 | 37 | 85 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 2 | 0 | 0 | 38 | 0 | 31 | 0 | 0 | 0 | 31 | 69 |
| 1:15 PM | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 2 | 0 | 0 | 45 | 0 | 36 | 0 | 0 | 0 | 36 | 83 |
| Total | 1 | 0 | 3 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 166 | 7 | 0 | 0 | 174 | 0 | 137 | 0 | 0 | 0 | 137 | 316 |
| Approach % | 25.0 | 0.0 | 75.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 0.6 | 95.4 | 4.0 | 0.0 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.3 | 0.0 | 0.9 | 0.0 | - | 1.3 | 0.3 | 0.0 | 0.0 | 0.0 | - | 0.3 | 0.3 | 52.5 | 2.2 | 0.0 | - | 55.1 | 0.0 | 43.4 | 0.0 | 0.0 | - | 43.4 | - |
| PHF | 0.250 | 0.000 | 0.375 | 0.000 | - | 0.500 | 0.250 | 0.000 | 0.000 | 0.000 | - | 0.250 | 0.250 | 0.943 | 0.875 | 0.000 | - | 0.946 | 0.000 | 0.926 | 0.000 | 0.000 | - | 0.926 | 0.929 |
| Lights | 0 | 0 | 3 | 0 | - | 3 | 1 | 0 | 0 | 0 | - | 1 | 0 | 152 | 7 | 0 | - | 159 | 0 | 125 | 0 | 0 | - | 125 | 288 |
| % Lights | 0.0 | - | 100.0 | - | - | 75.0 | 100.0 | - | - | - | - | 100.0 | 0.0 | 91.6 | 100.0 | - | - | 91.4 | - | 91.2 | - | - | - | 91.2 | 91.1 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 2 |
| % Buses | 0.0 | - | 0.0 | - | - | 0.0 | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | 1.5 | - | - | - | 1.5 | 0.6 |
| Trucks | 1 | 0 | 0 | 0 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 1 | 14 | 0 | 0 | - | 15 | 0 | 10 | 0 | 0 | - | 10 | 26 |
| % Trucks | 100.0 | - | 0.0 | - | - | 25.0 | 0.0 | - | - | - | - | 0.0 | 100.0 | 8.4 | 0.0 | - | - | 8.6 | - | 7.3 | - | - | - | 7.3 | 8.2 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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Location: 40.035378, -77.645544

Count Name:
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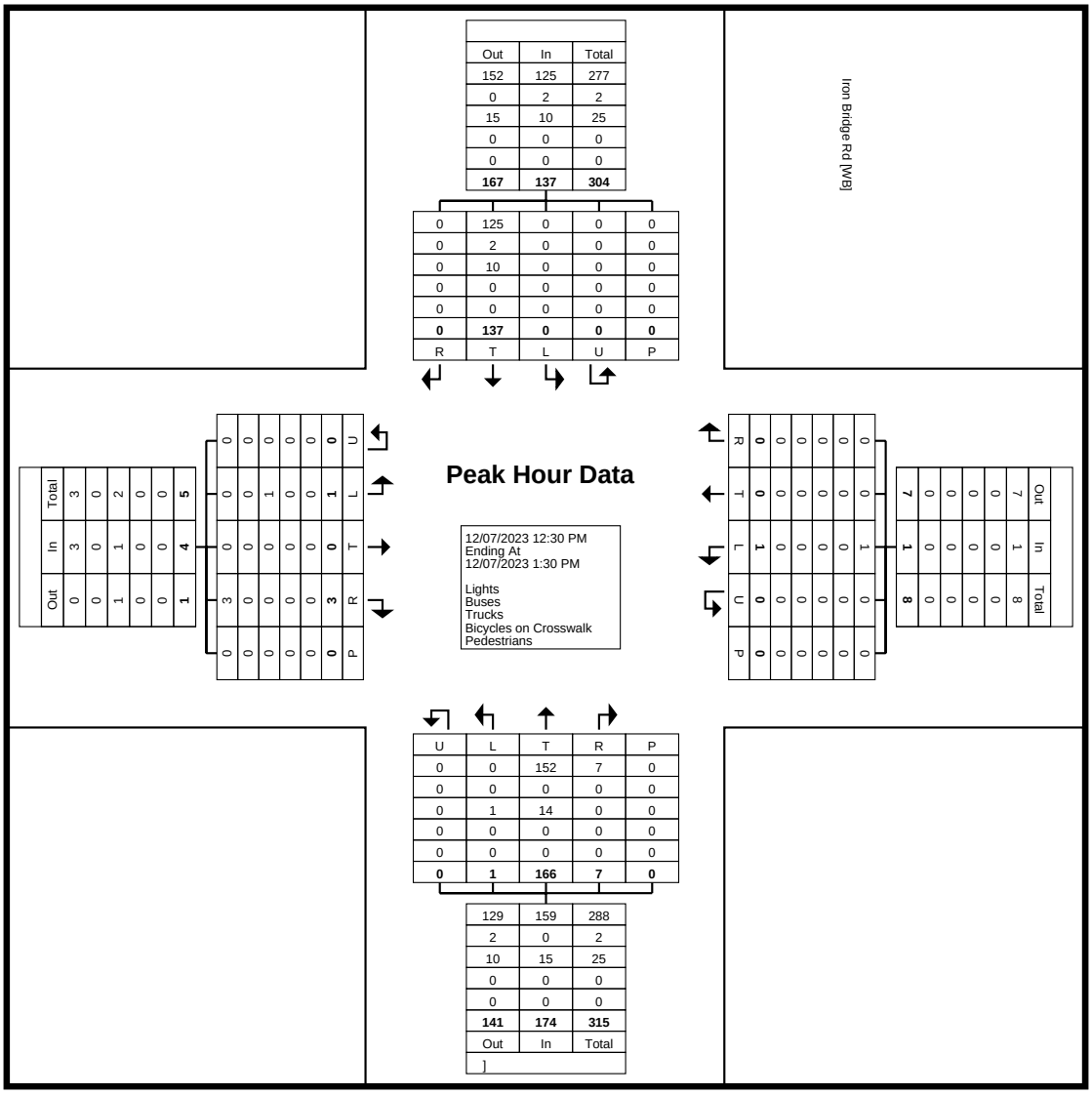


| Out | In | Total |
|---|---|---|
| 152 | 125 | 277 |
| 0 | 2 | 2 |
| 15 | 10 | 25 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **167** | **137** | **304** |

| R | T | L | U | P |
|---|---|---|---|---|
| 0 | 125 | 0 | 0 | 0 |
| 0 | 2 | 0 | 0 | 0 |
| 0 | 10 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **137** | **0** | **0** | **0** |

| U | L | T | R | P |
|---|---|---|---|---|
| 0 | 0 | 152 | 7 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 14 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **1** | **166** | **7** | **0** |

| | | |
|---|---|---|
| 129 | 159 | 288 |
| 2 | 0 | 2 |
| 10 | 15 | 25 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **141** | **174** | **315** |
| Out | In | Total |

]

Turning Movement Peak Hour Data Plot (12:30 PM)

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Cumberland County, PA
Thursday, December 7, 2023
Location: 40.035378, -77.645544

Count Name:
Site Code:
Start Date: 12/07/2023


# Turning Movement Peak Hour Data (3:30 PM)

| Start Time | Eastbound | | | | | | Westbound | | | | | | C Northbound | | | | | | Southbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Left | Thru | Right | U-Turn | Peds | App. Total | Int. Total |
| 3:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 146 | 5 | 0 | 0 | 152 | 0 | 36 | 0 | 0 | 0 | 36 | 190 |
| 3:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 87 | 4 | 1 | 0 | 93 | 0 | 30 | 0 | 0 | 0 | 30 | 123 |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 4 | 0 | 0 | 99 | 0 | 32 | 0 | 0 | 0 | 32 | 131 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 78 | 2 | 0 | 0 | 80 | 0 | 36 | 0 | 0 | 0 | 36 | 117 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 2 | 406 | 15 | 1 | 0 | 424 | 0 | 134 | 0 | 0 | 0 | 134 | 561 |
| Approach % | 0.0 | 0.0 | 0.0 | 0.0 | - | - | 100.0 | 0.0 | 0.0 | 0.0 | - | - | 0.5 | 95.8 | 3.5 | 0.2 | - | - | 0.0 | 100.0 | 0.0 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | - | 0.5 | 0.4 | 72.4 | 2.7 | 0.2 | - | 75.6 | 0.0 | 23.9 | 0.0 | 0.0 | - | 23.9 | - |
| PHF | 0.000 | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.375 | 0.000 | 0.000 | 0.000 | - | 0.375 | 0.500 | 0.695 | 0.750 | 0.250 | - | 0.697 | 0.000 | 0.931 | 0.000 | 0.000 | - | 0.931 | 0.738 |
| Lights | 0 | 0 | 0 | 0 | - | 0 | 3 | 0 | 0 | 0 | - | 3 | 1 | 389 | 15 | 1 | - | 406 | 0 | 128 | 0 | 0 | - | 128 | 537 |
| % Lights | - | - | - | - | - | - | 100.0 | - | - | - | - | 100.0 | 50.0 | 95.8 | 100.0 | 100.0 | - | 95.8 | - | 95.5 | - | - | - | 95.5 | 95.7 |
| Buses | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | 0 | - | 2 | 0 | 1 | 0 | 0 | - | 1 | 3 |
| % Buses | - | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | - | 0.5 | - | 0.7 | - | - | - | 0.7 | 0.5 |
| Trucks | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 1 | 15 | 0 | 0 | - | 16 | 0 | 5 | 0 | 0 | - | 5 | 21 |
| % Trucks | - | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | 50.0 | 3.7 | 0.0 | 0.0 | - | 3.8 | - | 3.7 | - | - | - | 3.7 | 3.7 |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Cumberland County, PA
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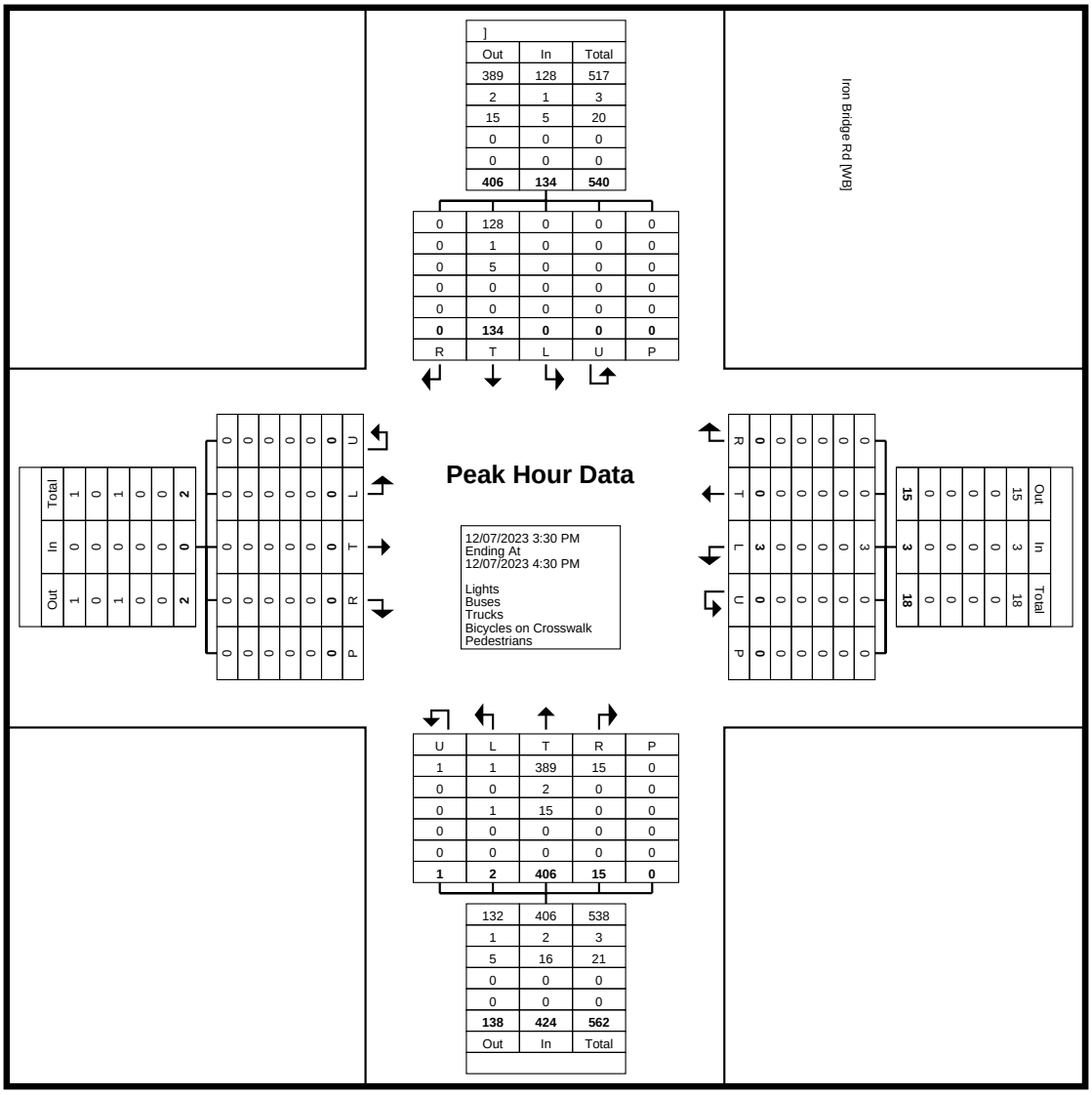



| ] | | |
|---|---|---|
| Out | In | Total |
| 389 | 128 | 517 |
| 2 | 1 | 3 |
| 15 | 5 | 20 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **406** | **134** | **540** |

| | | | | |
|---|---|---|---|---|
| 0 | 128 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 5 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **0** | **134** | **0** | **0** | **0** |
| R | T | L | U | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 1 | 0 | 1 | 0 | 0 | 0 | **2** |
| In | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Out | 1 | 0 | 1 | 0 | 0 | 0 | **2** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | U |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | L |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | T |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | R |
| 0 | 0 | 0 | 0 | 0 | 0 | **0** | P |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| R | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| T | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| L | **3** | 0 | 0 | 0 | 0 | 0 | 3 |
| U | **0** | 0 | 0 | 0 | 0 | 0 | 0 |
| P | **0** | 0 | 0 | 0 | 0 | 0 | 0 |

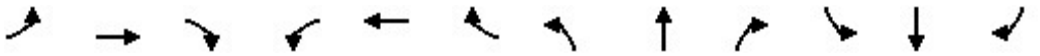
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **15** | 0 | 0 | 0 | 0 | 15 | Out | |
| **3** | 0 | 0 | 0 | 0 | 3 | In | |
| **18** | 0 | 0 | 0 | 0 | 18 | Total | |

| U | L | T | R | P |
|---|---|---|---|---|
| 1 | 1 | 389 | 15 | 0 |
| 0 | 0 | 2 | 0 | 0 |
| 0 | 1 | 15 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| **1** | **2** | **406** | **15** | **0** |

| | | |
|---|---|---|
| 132 | 406 | 538 |
| 1 | 2 | 3 |
| 5 | 16 | 21 |
| 0 | 0 | 0 |
| 0 | 0 | 0 |
| **138** | **424** | **562** |
| Out | In | Total |

Turning Movement Peak Hour Data Plot (3:30 PM)

# Appendix D: Synchro Outputs

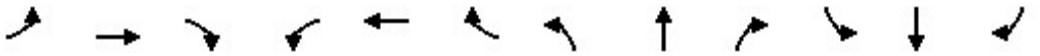


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1 | 18 | 0 | 0 | 2 | 108 | 6 | 0 | 338 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 1 | 18 | 0 | 0 | 2 | 108 | 6 | 0 | 338 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 0 | 0 | 1 | 21 | 0 | 0 | 2 | 127 | 7 | 0 | 398 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 532 | 536 | 398 | 534 | 532 | 130 | 398 | | | 134 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 532 | 536 | 398 | 534 | 532 | 130 | 398 | | | 134 | | |
| tC, single (s) | 8.1 | 7.5 | *6.4 | *8.1 | 7.5 | 6.2 | *4.9 | | | *4.9 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | *3.0 | 4.9 | *3.4 | *3.0 | 4.9 | 3.3 | *3.5 | | | *3.5 | | |
| p0 queue free % | 100 | 100 | 100 | 95 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 447 | 338 | 626 | 446 | 340 | 919 | 722 | | | 914 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 1 | 21 | 136 | 398 |
| Volume Left | 0 | 21 | 2 | 0 |
| Volume Right | 1 | 0 | 7 | 0 |
| cSH | 626 | 446 | 722 | 914 |
| Volume to Capacity | 0.00 | 0.05 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 4 | 0 | 0 |
| Control Delay (s) | 10.8 | 13.5 | 0.2 | 0.0 |
| Lane LOS | B | B | A | |
| Approach Delay (s) | 10.8 | 13.5 | 0.2 | 0.0 |
| Approach LOS | B | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.6 | | | |
| Intersection Capacity Utilization | 32.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

* User Entered Value

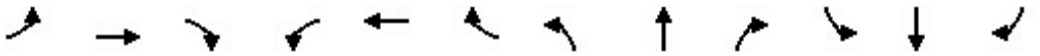


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 1 | 8 | 0 | 0 | 1 | 439 | 16 | 1 | 148 | 1 |
| Future Volume (Veh/h) | 1 | 0 | 1 | 8 | 0 | 0 | 1 | 439 | 16 | 1 | 148 | 1 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Hourly flow rate (vph) | 1 | 0 | 1 | 10 | 0 | 0 | 1 | 556 | 20 | 1 | 187 | 1 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 758 | 768 | 188 | 758 | 758 | 566 | 188 | | | 576 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 758 | 768 | 188 | 758 | 758 | 566 | 188 | | | 576 | | |
| tC, single (s) | 8.1 | 7.5 | *6.4 | *8.1 | 7.5 | 6.2 | *4.9 | | | *4.9 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | *3.0 | 4.9 | *3.4 | *3.0 | 4.9 | 3.3 | *3.5 | | | *3.5 | | |
| p0 queue free % | 100 | 100 | 100 | 97 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 294 | 239 | 828 | 293 | 242 | 524 | 871 | | | 613 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 2 | 10 | 577 | 189 |
| Volume Left | 1 | 10 | 1 | 1 |
| Volume Right | 1 | 0 | 20 | 1 |
| cSH | 434 | 293 | 871 | 613 |
| Volume to Capacity | 0.00 | 0.03 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 3 | 0 | 0 |
| Control Delay (s) | 13.3 | 17.7 | 0.0 | 0.1 |
| Lane LOS | B | C | A | A |
| Approach Delay (s) | 13.3 | 17.7 | 0.0 | 0.1 |
| Approach LOS | B | C | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.3 | | | |
| Intersection Capacity Utilization | 34.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

* User Entered Value

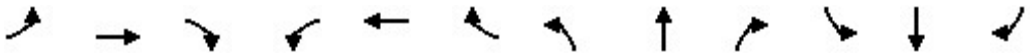


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1 | 19 | 0 | 0 | 2 | 112 | 6 | 0 | 350 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 1 | 19 | 0 | 0 | 2 | 112 | 6 | 0 | 350 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| Hourly flow rate (vph) | 0 | 0 | 1 | 22 | 0 | 0 | 2 | 132 | 7 | 0 | 412 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 552 | 555 | 412 | 552 | 552 | 136 | 412 | | | 139 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 552 | 555 | 412 | 552 | 552 | 136 | 412 | | | 139 | | |
| tC, single (s) | 8.1 | 7.5 | *6.4 | *8.1 | 7.5 | 6.2 | *4.9 | | | *4.9 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | *3.0 | 4.9 | *3.4 | *3.0 | 4.9 | 3.3 | *3.5 | | | *3.5 | | |
| p0 queue free % | 100 | 100 | 100 | 95 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 432 | 328 | 614 | 430 | 330 | 913 | 712 | | | 910 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 1 | 22 | 141 | 412 |
| Volume Left | 0 | 22 | 2 | 0 |
| Volume Right | 1 | 0 | 7 | 0 |
| cSH | 614 | 430 | 712 | 910 |
| Volume to Capacity | 0.00 | 0.05 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 4 | 0 | 0 |
| Control Delay (s) | 10.9 | 13.8 | 0.2 | 0.0 |
| Lane LOS | B | B | A | |
| Approach Delay (s) | 10.9 | 13.8 | 0.2 | 0.0 |
| Approach LOS | B | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.6 | | | |
| Intersection Capacity Utilization | 32.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

* User Entered Value



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 0 | 1 | 8 | 0 | 0 | 1 | 455 | 17 | 1 | 153 | 1 |
| Future Volume (Veh/h) | 1 | 0 | 1 | 8 | 0 | 0 | 1 | 455 | 17 | 1 | 153 | 1 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |
| Hourly flow rate (vph) | 1 | 0 | 1 | 10 | 0 | 0 | 1 | 576 | 22 | 1 | 194 | 1 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 786 | 796 | 194 | 786 | 786 | 587 | 195 | | | 598 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 786 | 796 | 194 | 786 | 786 | 587 | 195 | | | 598 | | |
| tC, single (s) | 8.1 | 7.5 | *6.4 | *8.1 | 7.5 | 6.2 | *4.9 | | | *4.9 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | *3.0 | 4.9 | *3.4 | *3.0 | 4.9 | 3.3 | *3.5 | | | *3.5 | | |
| p0 queue free % | 100 | 100 | 100 | 96 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 279 | 228 | 820 | 278 | 232 | 510 | 866 | | | 601 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 2 | 10 | 599 | 196 |
| Volume Left | 1 | 10 | 1 | 1 |
| Volume Right | 1 | 0 | 22 | 1 |
| cSH | 416 | 278 | 866 | 601 |
| Volume to Capacity | 0.00 | 0.04 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 3 | 0 | 0 |
| Control Delay (s) | 13.7 | 18.4 | 0.0 | 0.1 |
| Lane LOS | B | C | A | A |
| Approach Delay (s) | 13.7 | 18.4 | 0.0 | 0.1 |
| Approach LOS | B | C | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.3 | | | |
| Intersection Capacity Utilization | 35.6% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

* User Entered Value

# Appendix E: Sight Distance Analysis

M-950S
(03-04)
PENNDOT

# DRIVEWAY SIGHT DISTANCE MEASUREMENTS

## (FOR LOCAL ROADS, USE PENNDOT PUB 70)

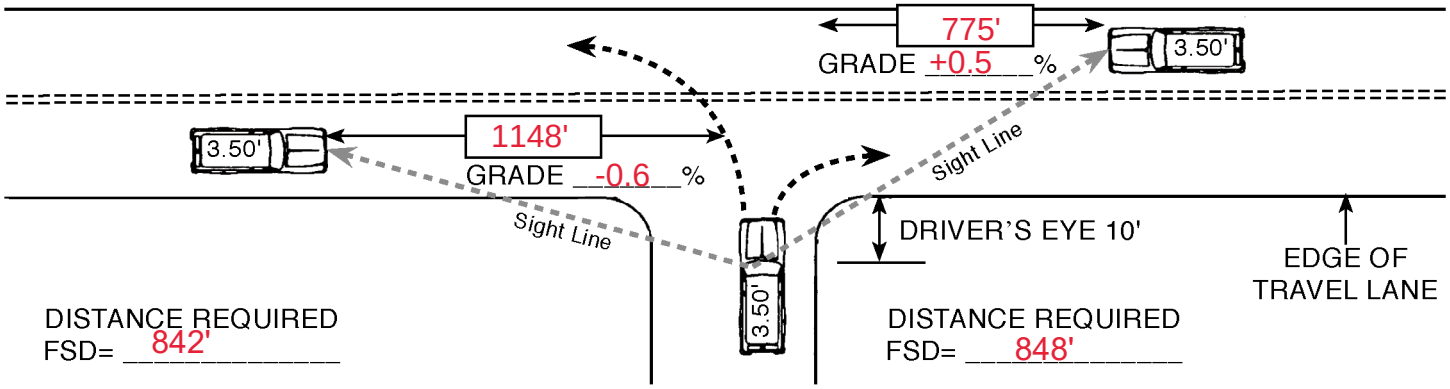
APPLICANT Stantec APPLICATION NO. _____

S.R._____SEG._____OFFSET_____ LEGAL SPEED LIMIT 55 mph

MEASURED BY_____ DATE 9/16/24

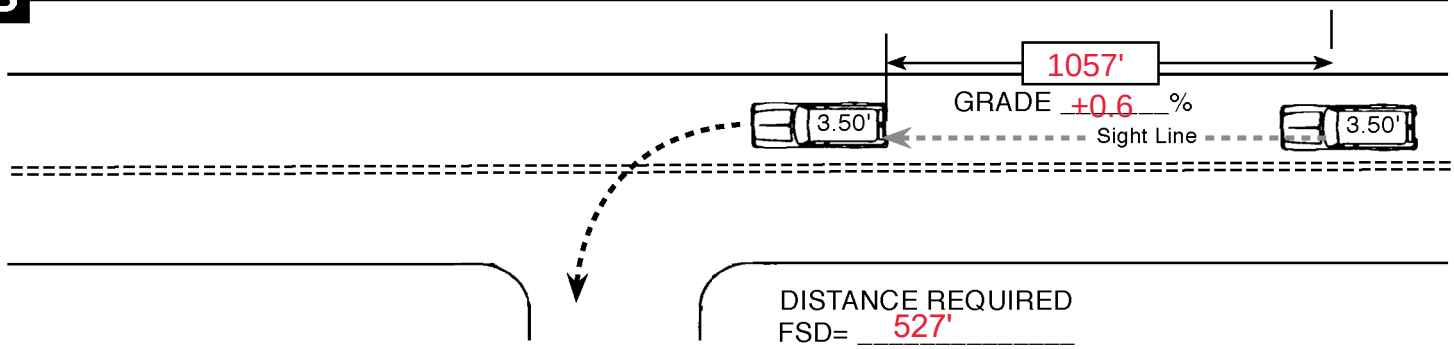
FOR DEPARTMENT USE ONLY: Safe-Running Speed _____ 85th Percentile Speed _____

## A



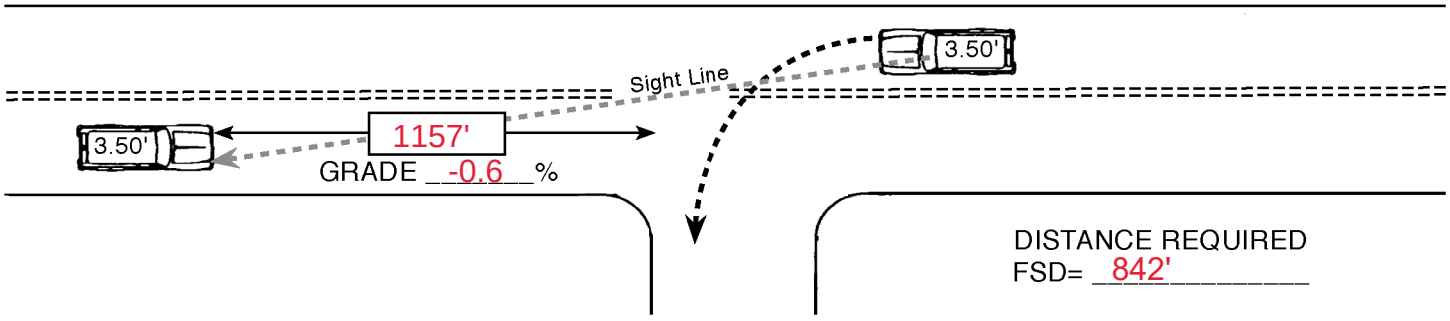

THE MAXIMUM LENGTH OF ROADWAY ALONG WHICH A DRIVER AT A DRIVEWAY LOCATION CAN CONTINUOUSLY SEE ANOTHER VEHICLE APPROACHING ON THE ROADWAY.

## B




THE MAXIMUM LENGTH OF ROADWAY ALONG WHICH A DRIVER ON THE ROADWAY CAN CONTINUOUSLY SEE THE REAR OF A VEHICLE WHICH IS LOCATED IN THE DRIVER'S TRAVEL LANE AND WHICH IS POSITIONED TO MAKE A LEFT TURN INTO A DRIVEWAY.

## C




THE MAXIMUM LENGTH OF ROADWAY ALONG WHICH A DRIVER OF A VEHICLE INTENDING TO MAKE A LEFT TURN INTO A DRIVEWAY CAN CONTINUOUSLY SEE A VEHICLE APPROACHING FROM THE OPPOSITE DIRECTION.

# FORMULA SIGHT DISTANCE TABLE

| Speed (V) (Miles Per Hour) | Average Grade (G) (Percent) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Use plus grades when approaching vehicle is travelling upgrade.** | | | | | | | | | | |
| | 0.0 | +1.0 | +2.0 | +3.0 | +4.0 | +5.0 | +6.0 | +7.0 | +8.0 | +9.0 | +10.0 |
| 25 | 147 | 145 | 144 | 143 | 142 | 140 | 139 | 138 | 137 | 136 | 135 |
| 30 | 196 | 194 | 191 | 189 | 187 | 185 | 183 | 182 | 180 | 178 | 177 |
| 35 | 249 | 245 | 242 | 239 | 236 | 233 | 231 | 228 | 226 | 224 | 221 |
| 40 | 314 | 309 | 304 | 299 | 295 | 291 | 287 | 284 | 280 | 277 | 274 |
| 45 | 383 | 376 | 370 | 364 | 358 | 353 | 348 | 343 | 339 | 334 | 330 |
| 50 | 462 | 453 | 444 | 436 | 429 | 422 | 415 | 409 | 403 | 397 | 392 |
| 55 | 538 | 527 | 517 | 508 | 499 | 490 | 482 | 475 | 468 | 461 | 454 |
| | **Use negative grades when approaching vehicle is travelling downgrade.** | | | | | | | | | | |
| | 0.0 | -1.0 | -2.0 | -3.0 | -4.0 | -5.0 | -6.0 | -7.0 | -8.0 | -9.0 | -10.0 |
| 25 | 147 | 148 | 150 | 151 | 153 | 155 | 157 | 159 | 161 | 164 | 166 |
| 30 | 196 | 199 | 201 | 204 | 207 | 210 | 214 | 217 | 221 | 226 | 230 |
| 35 | 249 | 252 | 256 | 260 | 265 | 269 | 275 | 280 | 286 | 292 | 299 |
| 40 | 314 | 319 | 325 | 331 | 338 | 345 | 352 | 360 | 369 | 379 | 389 |
| 45 | 383 | 390 | 398 | 406 | 415 | 425 | 435 | 447 | 459 | 472 | 487 |
| 50 | 462 | 471 | 481 | 492 | 504 | 517 | 531 | 546 | 563 | 581 | 600 |
| 55 | 538 | 550 | 562 | 576 | 590 | 606 | 622 | 641 | 661 | 682 | 706 |

# Appendix F: Turning Lane Warrant Analysis

# Turn Lane Warrant and Length Analysis Workbook

## STUDY LOCATION AND ANALYSIS INFORMATION

| | | | |
|---|---|---|---|
| **Municipality:** | Letterkenny Township | **Analysis Date:** | 2/28/2024 |
| **County:** | Franklin County | **Conducted By:** | CA |
| **PennDOT Engineering District:** | 8 | **Checked By:** | MD |
| | | **Agency/Company Name:** | Stantec Consulting |

**Intersection & Approach Description:**

| | | | |
|---|---|---|---|
| **Analysis Period:** | 2028 Build | **Number of Approach Lanes:** | 1 |
| **Design Hour:** | AM Peak Hour | **Undivided or Divided Highway:** | Undivided |
| **Intersection Control:** | Unsignalized | | |
| **Posted Speed Limit (MPH):** | 55 | **Type of Analysis** | |
| **Type of Terrain:** | Level | **Left or Right-Turn Lane Analysis?:** | Left Turn Lane |

## VOLUME CALCULATIONS

### Left Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | 4 | 100.0% | 6 |
| | Through | - | 112 | 11.0% | 119 |
| | Right | Yes | 6 | 2.0% | 7 |
| Opposing | Left | Yes | 0 | 2.0% | 0 |
| | Through | - | 350 | 8.0% | 364 |
| | Right | Yes | 0 | 100.0% | 0 |

| | |
|---|---|
| **Advancing Volume:** | 132 |
| **Opposing Volume:** | 364 |
| **Left Turn Volume:** | 6 |
| **% Left Turns in Advancing Volume:** | 4.55% |

### Right Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | | | N/A |
| | Through | - | | | N/A |
| | Right | - | | | N/A |

| | |
|---|---|
| **Advancing Volume:** | N/A |
| **Right Turn Volume:** | N/A |

## TURN LANE WARRANT FINDINGS

### Left Turn Lane Warrant Findings

**Applicable Warrant Figure:** **Figure 5**

**Warrant Met?:** **No**

### Right Turn Lane Warrant Findings

**Applicable Warrant Figure:** **N/A**

**Warrant Met?:** **N/A**

## TURN LANE LENGTH CALCULATIONS

| | |
|---|---|
| **Intersection Control:** | Unsignalized |
| **Design Hour Volume of Turning Lane:** | 6 |
| **Cycles Per Hour (Assumed):** | Known |
| **Cycles Per Hour (If Known):** | 40 |

**Average # of Vehicles/Cycle:** N/A

**PennDOT Publication 46, Exhibit 11-6**

| Type of Traffic Control | Speed (MPH) | | | | | |
|---|---|---|---|---|---|---|
| | 25-35 | | 40-45 | | 50-60 | |
| | Turn Demand Volume | | | | | |
| | High | Low | High | Low | High | Low |
| Signalized | A | A | B or C | B or C | B or C | B or C |
| Unsignalized | A | A | C | B | B or C | B |

| | | |
|---|---|---|
| **Left Turn Lane Storage Length, Condition A:** | **N/A** | **Feet** |
| **Condition B:** | **N/A** | **Feet** |
| **Condition C:** | **N/A** | **Feet** |
| **Required Left Turn Lane Storage Length:** | **N/A** | **Feet** |

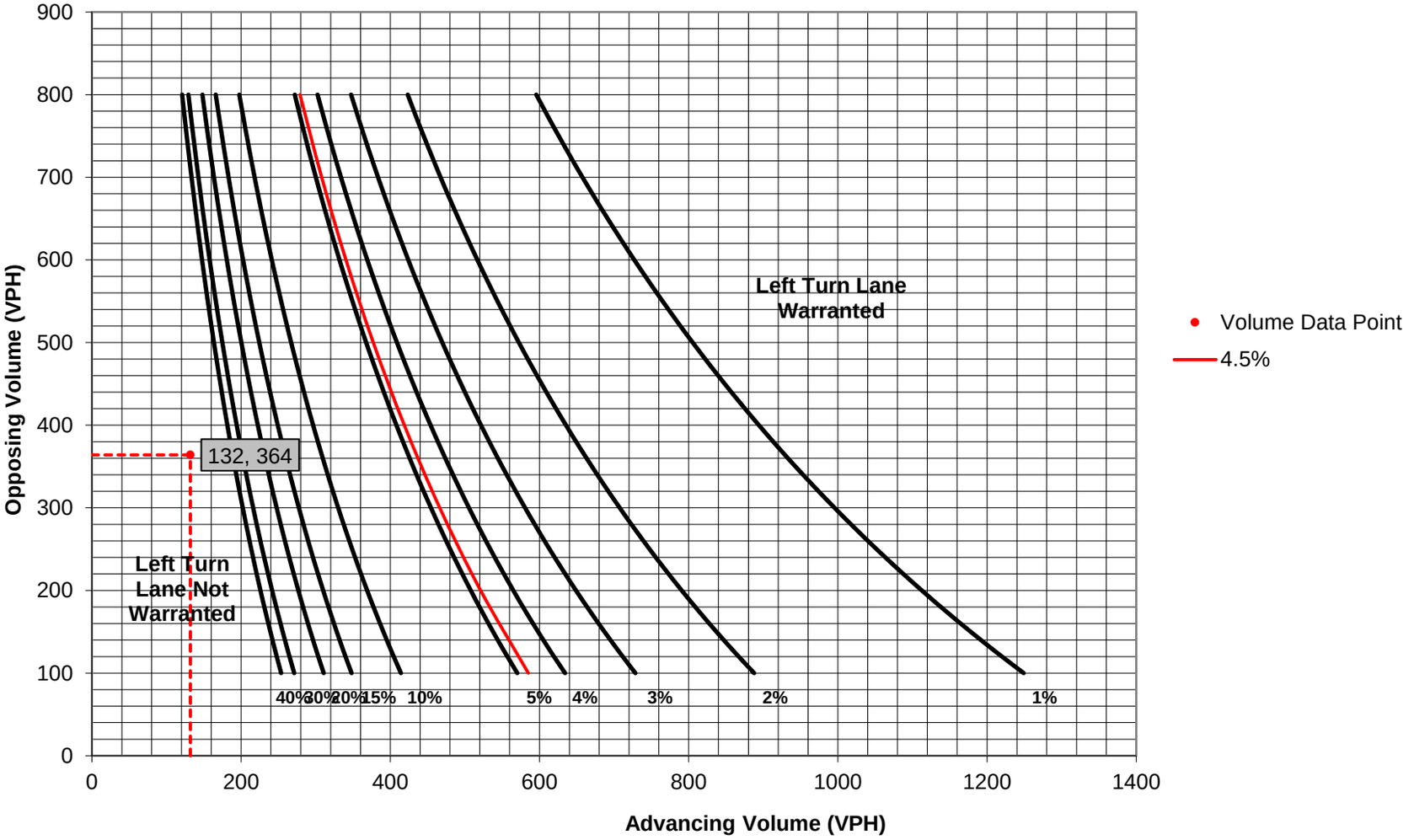
**Additional Findings:**

**N/A**

**Additional Comments / Justifications:**

**Figure 5. Warrant for left turn storage lanes on two-lane highways (55 mph speed, unsignalized and signalized intersections)**

(L = % Left Turns in Advancing Volume)



# Turn Lane Warrant and Length Analysis Workbook

## STUDY LOCATION AND ANALYSIS INFORMATION

| | | | |
|---|---|---|---|
| **Municipality:** | Letterkenny Township | **Analysis Date:** | 2/28/2024 |
| **County:** | Franklin County | **Conducted By:** | CA |
| **PennDOT Engineering District:** | 8 | **Checked By:** | MD |
| | | **Agency/Company Name:** | Stantec Consulting |

**Intersection & Approach Description:**

| | | | |
|---|---|---|---|
| **Analysis Period:** | 2028 Build | **Number of Approach Lanes:** | 1 |
| **Design Hour:** | AM Peak Hour | **Undivided or Divided Highway:** | Undivided |
| **Intersection Control:** | Unsignalized | | |
| **Posted Speed Limit (MPH):** | 55 | | **Type of Analysis** |
| **Type of Terrain:** | Level | **Left or Right-Turn Lane Analysis?:** | Right Turn Lane |

## VOLUME CALCULATIONS

### Left Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | | | N/A |
| | Through | - | | | N/A |
| | Right | Yes | | | N/A |
| Opposing | Left | Yes | | | N/A |
| | Through | - | | | N/A |
| | Right | Yes | | | N/A |

| | |
|---|---|
| **Advancing Volume:** | N/A |
| **Opposing Volume:** | N/A |
| **Left Turn Volume:** | N/A |
| **% Left Turns in Advancing Volume:** | N/A |

### Right Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | 0 | 2.0% | 0 |
| | Through | - | 350 | 8.0% | 364 |
| | Right | - | 0 | 100.0% | 0 |

| | |
|---|---|
| **Advancing Volume:** | 364 |
| **Right Turn Volume:** | 0 |

## TURN LANE WARRANT FINDINGS

### Left Turn Lane Warrant Findings

**Applicable Warrant Figure:** N/A

**Warrant Met?:** N/A

### Right Turn Lane Warrant Findings

**Applicable Warrant Figure:** Figure 10

**Warrant Met?:** No

## TURN LANE LENGTH CALCULATIONS

| | |
|---|---|
| **Intersection Control:** | Unsignalized |
| **Design Hour Volume of Turning Lane:** | 0 |
| **Cycles Per Hour (Assumed):** | Known |
| **Cycles Per Hour (If Known):** | 40 |

**Average # of Vehicles/Cycle:** N/A

**PennDOT Publication 46, Exhibit 11-6**

| Type of Traffic Control | Speed (MPH) | | | | | |
|---|---|---|---|---|---|---|
| | 25-35 | | 40-45 | | 50-60 | |
| | Turn Demand Volume | | | | | |
| | High | Low | High | Low | High | Low |
| Signalized | A | A | B or C | B or C | B or C | B or C |
| Unsignalized | A | A | C | B | B or C | B |

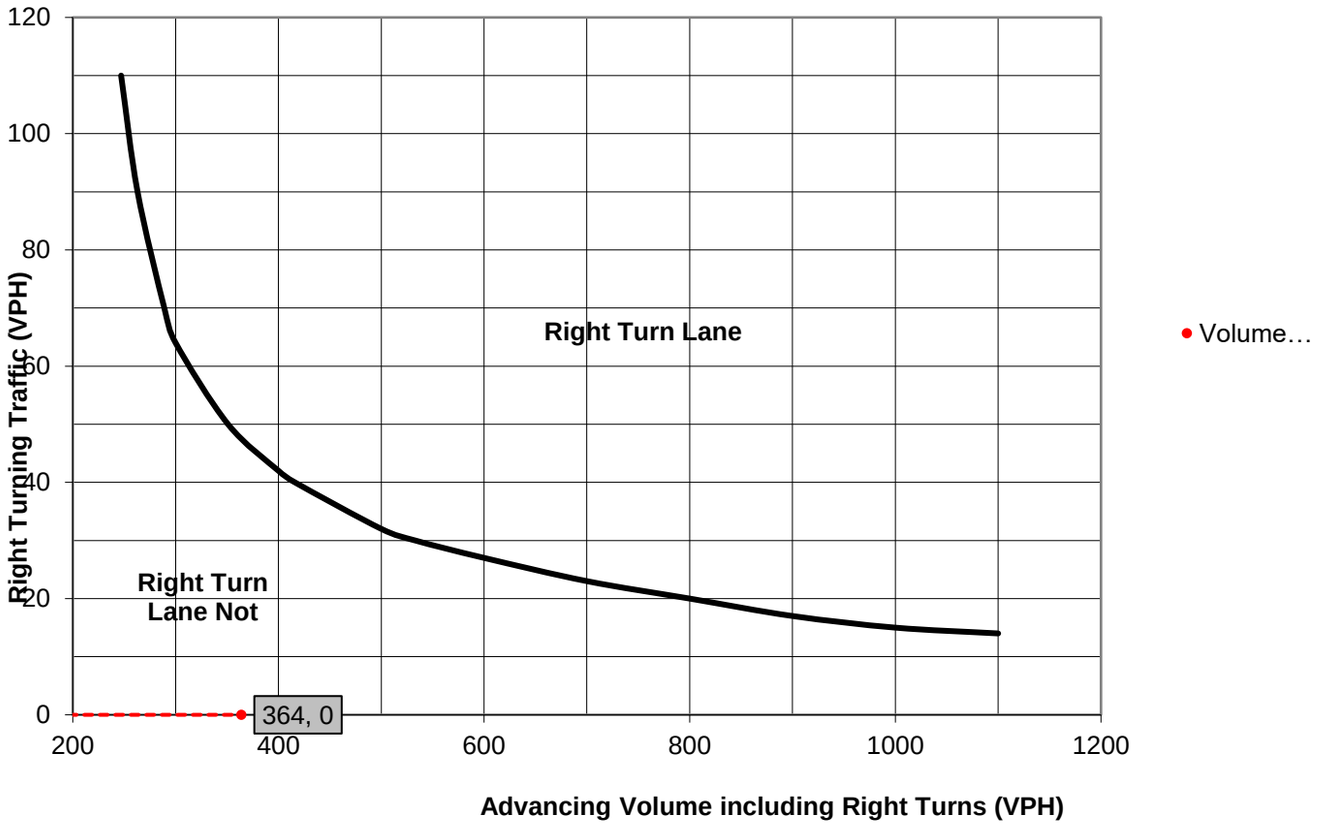
| | | |
|---|---|---|
| **Right Turn Lane Storage Length, Condition A:** | N/A | Feet |
| **Condition B:** | N/A | Feet |
| **Condition C:** | N/A | Feet |
| **Required Right Turn Lane Storage Length:** | N/A | Feet |

**Additional Findings:**

N/A

**Additional Comments / Justifications:**

**Figure 10. Warrant for right turn lanes on two-lane roadways**
**(45 mph or greater speeds, unsignalized and signalized intersections)**



# Turn Lane Warrant and Length Analysis Workbook

## STUDY LOCATION AND ANALYSIS INFORMATION

| | | | |
|---|---|---|---|
| **Municipality:** | Letterkenny Township | **Analysis Date:** | 2/28/2024 |
| **County:** | Franklin County | **Conducted By:** | CA |
| **PennDOT Engineering District:** | 8 | **Checked By:** | MD |
| | | **Agency/Company Name:** | Stantec Consulting |

**Intersection & Approach Description:**

| | | | |
|---|---|---|---|
| **Analysis Period:** | 2028 Build | **Number of Approach Lanes:** | 1 |
| **Design Hour:** | PM Peak Hour | **Undivided or Divided Highway:** | Undivided |
| **Intersection Control:** | Unsignalized | | |
| **Posted Speed Limit (MPH):** | 55 | **Type of Analysis** | |
| **Type of Terrain:** | Level | **Left or Right-Turn Lane Analysis?:** | Left Turn Lane |

## VOLUME CALCULATIONS

### Left Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | 1 | 100.0% | 2 |
| | Through | - | 455 | 4.0% | 465 |
| | Right | Yes | 17 | 2.0% | 18 |
| Opposing | Left | Yes | 1 | 2.0% | 2 |
| | Through | - | 153 | 5.0% | 157 |
| | Right | Yes | 0 | 100.0% | 0 |

| | |
|---|---|
| **Advancing Volume:** | 485 |
| **Opposing Volume:** | 159 |
| **Left Turn Volume:** | 2 |
| **% Left Turns in Advancing Volume:** | 0.41% |

### Right Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | | | N/A |
| | Through | - | | | N/A |
| | Right | - | | | N/A |

| | |
|---|---|
| **Advancing Volume:** | N/A |
| **Right Turn Volume:** | N/A |

## TURN LANE WARRANT FINDINGS

### Left Turn Lane Warrant Findings

**Applicable Warrant Figure:** **Figure 5**

**Warrant Met?:** **No**

### Right Turn Lane Warrant Findings

**Applicable Warrant Figure:** **N/A**

**Warrant Met?:** **N/A**

## TURN LANE LENGTH CALCULATIONS

| | |
|---|---|
| **Intersection Control:** | Unsignalized |
| **Design Hour Volume of Turning Lane:** | 2 |
| **Cycles Per Hour (Assumed):** | Known |
| **Cycles Per Hour (If Known):** | 40 |

**Average # of Vehicles/Cycle:** N/A

**PennDOT Publication 46, Exhibit 11-6**

| Type of Traffic Control | Speed (MPH) | | | | | |
|---|---|---|---|---|---|---|
| | 25-35 | | 40-45 | | 50-60 | |
| | Turn Demand Volume | | | | | |
| | High | Low | High | Low | High | Low |
| Signalized | A | A | B or C | B or C | B or C | B or C |
| Unsignalized | A | A | C | B | B or C | B |

| | | |
|---|---|---|
| **Left Turn Lane Storage Length, Condition A:** | **N/A** | **Feet** |
| **Condition B:** | **N/A** | **Feet** |
| **Condition C:** | **N/A** | **Feet** |
| **Required Left Turn Lane Storage Length:** | **N/A** | **Feet** |

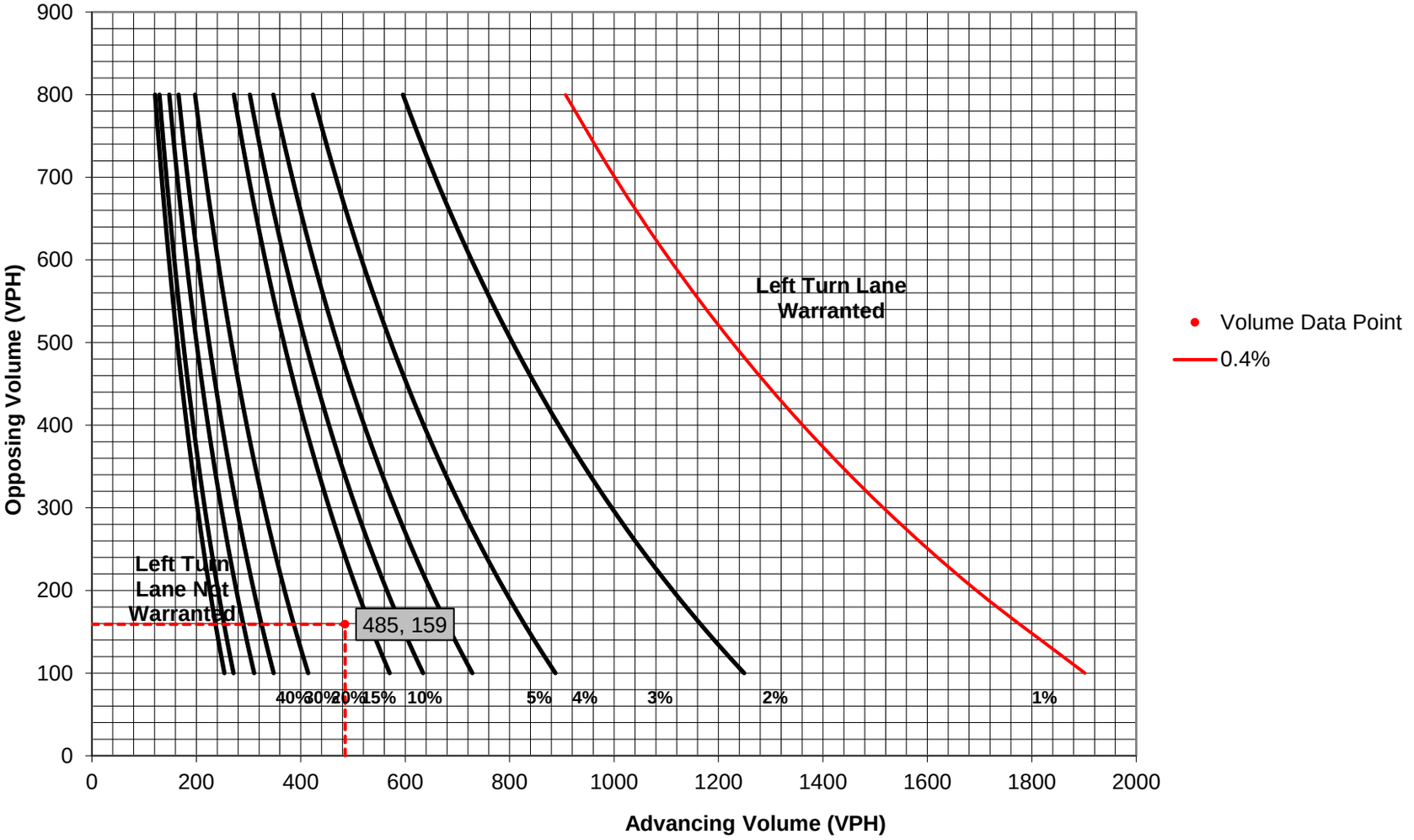
**Additional Findings:**

**N/A**

**Additional Comments / Justifications:**

**Figure 5. Warrant for left turn storage lanes on two-lane highways (55 mph speed, unsignalized and signalized intersections)**

(L = % Left Turns in Advancing Volume)



# Turn Lane Warrant and Length Analysis Workbook

## STUDY LOCATION AND ANALYSIS INFORMATION

| | | | |
|---|---|---|---|
| **Municipality:** | Letterkenny Township | **Analysis Date:** | 2/28/2024 |
| **County:** | Franklin County | **Conducted By:** | CA |
| **PennDOT Engineering District:** | 8 | **Checked By:** | MD |
| | | **Agency/Company Name:** | Stantec Consulting |

**Intersection & Approach Description:**

| | | | |
|---|---|---|---|
| **Analysis Period:** | 2028 Build | **Number of Approach Lanes:** | 1 |
| **Design Hour:** | PM Peak Hour | **Undivided or Divided Highway:** | Undivided |
| **Intersection Control:** | Unsignalized | | |
| **Posted Speed Limit (MPH):** | 55 | | **Type of Analysis** |
| **Type of Terrain:** | Level | **Left or Right-Turn Lane Analysis?:** | Right Turn Lane |

## VOLUME CALCULATIONS

### Left Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | | | N/A |
| | Through | - | | | N/A |
| | Right | Yes | | | N/A |
| Opposing | Left | Yes | | | N/A |
| | Through | - | | | N/A |
| | Right | Yes | | | N/A |

| | |
|---|---|
| **Advancing Volume:** | N/A |
| **Opposing Volume:** | N/A |
| **Left Turn Volume:** | N/A |
| **% Left Turns in Advancing Volume:** | N/A |

### Right Turn Lane Volume Calculations

| Movement | | Include? | Volume | % Trucks | PCEV |
|---|---|---|---|---|---|
| Advancing | Left | Yes | 1 | 2.0% | 2 |
| | Through | - | 153 | 5.0% | 157 |
| | Right | - | 0 | 100.0% | 0 |

| | |
|---|---|
| **Advancing Volume:** | 159 |
| **Right Turn Volume:** | 0 |

## TURN LANE WARRANT FINDINGS

### Left Turn Lane Warrant Findings

**Applicable Warrant Figure:** N/A

**Warrant Met?:** N/A

### Right Turn Lane Warrant Findings

**Applicable Warrant Figure:** Figure 10

**Warrant Met?:** No

## TURN LANE LENGTH CALCULATIONS

| | |
|---|---|
| **Intersection Control:** | Unsignalized |
| **Design Hour Volume of Turning Lane:** | 0 |
| **Cycles Per Hour (Assumed):** | Known |
| **Cycles Per Hour (If Known):** | 40 |

**Average # of Vehicles/Cycle:** N/A

**PennDOT Publication 46, Exhibit 11-6**

| Type of Traffic Control | Speed (MPH) | | | | | |
|---|---|---|---|---|---|---|
| | 25-35 | | 40-45 | | 50-60 | |
| | Turn Demand Volume | | | | | |
| | High | Low | High | Low | High | Low |
| Signalized | A | A | B or C | B or C | B or C | B or C |
| Unsignalized | A | A | C | B | B or C | B |

| | | |
|---|---|---|
| **Right Turn Lane Storage Length, Condition A:** | N/A | Feet |
| **Condition B:** | N/A | Feet |
| **Condition C:** | N/A | Feet |
| **Required Right Turn Lane Storage Length:** | N/A | Feet |

**Additional Findings:**

N/A

**Additional Comments / Justifications:**

**Figure 10. Warrant for right turn lanes on two-lane roadways**
**(45 mph or greater speeds, unsignalized and signalized intersections)**