ALLEGHENY
COUNTY AIRPORT

DRAFT

Environmental Assessment for the Runway 10-28 Runway Safety Area Improvement Project

February 2022

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List of Acronyms

ACAA	Allegheny County Airport Authority
ACEIT	Airport Construction Emissions Inventory Tool
AGC	Allegheny County Airport
APE	Area of Potential Effects
ASDA	Accelerate Stop Distance Available
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
Db	Decibel
DCNR	Department of Conservation and Natural Resources
DEP	Department of Environmental Protection
EA	Environmental Assessment
EMAS	Engineered Material Arresting System
EO	Executive Order
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
Kg	Kilogram
LDA	Landing Distance Available
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOX	Nitrogen Oxides
OSW	Other Surface Water
PIT	Pittsburg International Airport
PM_{10}	Particulate Matter Less Than or Equal to 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
PNDI	Pennsylvania Natural Diversity Inventory
RCRA	Resource Conservation and Recovery Act
RSA	Runway Safety Area
SHPO	State Historic Preservation Office
SOX	Sulfur Oxides
STEP	South Taylor Environmental Park
TODA	Takeoff Distance Available
TORA	Takeoff Run Available
U.S.C	United States Code
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compound
WHMP	Wildlife Hazard Management Plan

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CHAPTER 1

Purpose and Need

1.1 Introduction

The Allegheny County Airport Authority (ACAA) proposes to improve the Runway 10-28 Runway Safety Area (RSA) at the Allegheny County Airport (AGC) to meet standards and safety requirements as established by the Federal Aviation Administration (FAA) for runways serving the types of aircraft that typically access the airport.[1] AGC does not currently offer a runway with a standard RSA. The Proposed Project includes expanding the Runway 10 and Runway 28 RSAs with fill, installing an Engineered Material Arresting System (EMAS) at each Runway end, and widening the mid-Runway 28 RSA with fill. The need for Runway 10-28 RSA improvements was identified in the 2017 AGC Master Plan Update.[2]

This proposal requires certain decisions and approvals by the FAA, and these federal actions are subject to the National Environmental Policy Act of 1969 (NEPA). This Environmental Assessment (EA) was prepared in accordance with NEPA; Council on Environmental Quality (CEQ) regulations implementing NEPA (2020); FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (2015), FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions* (2006); and the *Order 1050.1F Desk Reference* (2020). The FAA is the lead federal agency with primary responsibility to ensure the requested federal actions comply with NEPA.

Per Section 163 of the FAA Reauthorization Act (2018), FAA has determined that all components of the Proposed Project are under FAA approval authority. All project components are considered in this NEPA analysis to avoid diminishing the potential significance of impacts associated with the Proposed Project and to properly consider connected actions, such as actions that are closely related and cannot proceed without previous or simultaneous actions or actions that are interdependent parts of a larger action and depend on the larger action for justification.[3]

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[1] FAA, 1999. *Order 5200.8: Runway Safety Area Program*. October; FAA, 2004. *Order 5200.9, Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*; FAA 2012. *Advisory Circular (AC) 150/5300-13A-Airport Design*; and FAA 2019 *Errata Sheet for AC 150/5300-13A, Airport Design, Consolidated Change 1.*

[2] *Allegheny County Airport 2017 Master Plan Update*. Prepared by McFarland Johnson for Allegheny County Airport Authority.

[3] CEQ 2020, *NEPA Implementing Regulations,* 40 CFR Section 1501.9(e).

1.2 Airport Information

1.2.1 Airport Physical Setting

AGC is located on 432 acres in West Mifflin Borough, Allegheny County approximately nine miles from Pittsburgh, Pennsylvania (**Figure 1-1**). The airport is bordered by State Highway 885 (Lebanon Road) and Union Railroad line to the west, where they run through a tunnel beneath Runway 10, and Lebanon Church Road to the south and east. The airport boundary at the Runway 10 end is also adjacent to the U.S. Steel South Taylor Environmental Park (STEP) Landfill and Treatment Plant. The airport is generally situated among residential, commercial, and industrial land uses and was built on top of a hill with steep slopes abutting the existing RSAs.

1.2.2 Airport Services, Role, and Activity

AGC opened in 1931 and served as Pittsburgh's main commercial airport until Pittsburgh International Airport (PIT) was constructed in 1952. Due to its contribution to local aviation history from 1931 through 1973 and the historic architecture of many of the facilities, areas of the airport are considered a Historic District eligible for listing in the National Register of Historic Places in accordance with the National Historic Preservation Act (54 U.S.C. § 300101 *et seq*). AGC now operates as a national, non-primary general aviation airport designated as a reliever airport for PIT.[4] Rostraver Airport is 10 miles to the southeast, PIT is 16 miles to the northwest, Washington County Airport is 21 miles to the southwest, and Arnold Palmer Regional Airport is 24 miles to the east.[5]

The two runways and one heliport at AGC primarily support business, recreation, and corporate general aviation. Runway 10-28 is 6,501 feet long and 150 feet wide, and Runway 13-31 is 3,825 feet long and 100 feet wide. Additional airport facilities consist of a terminal, air traffic control tower, numerous hangars, and three warehouses. Businesses located on the airport include two full-service fixed base operators, an aviation maintenance school, air medical transport services, and flight training operations.

Table 1-1 summarizes the number of AGC annual aircraft operations[6] for recent years and the estimated activity for select forecast years. AGC has seen a gradual decline in total operations since its peak in the late 1990s (**Figure 1-2**).[7] Note that the Proposed Project does not impact the volume of anticipated operations at AGC, and these data are given only to help characterize the airport environment.

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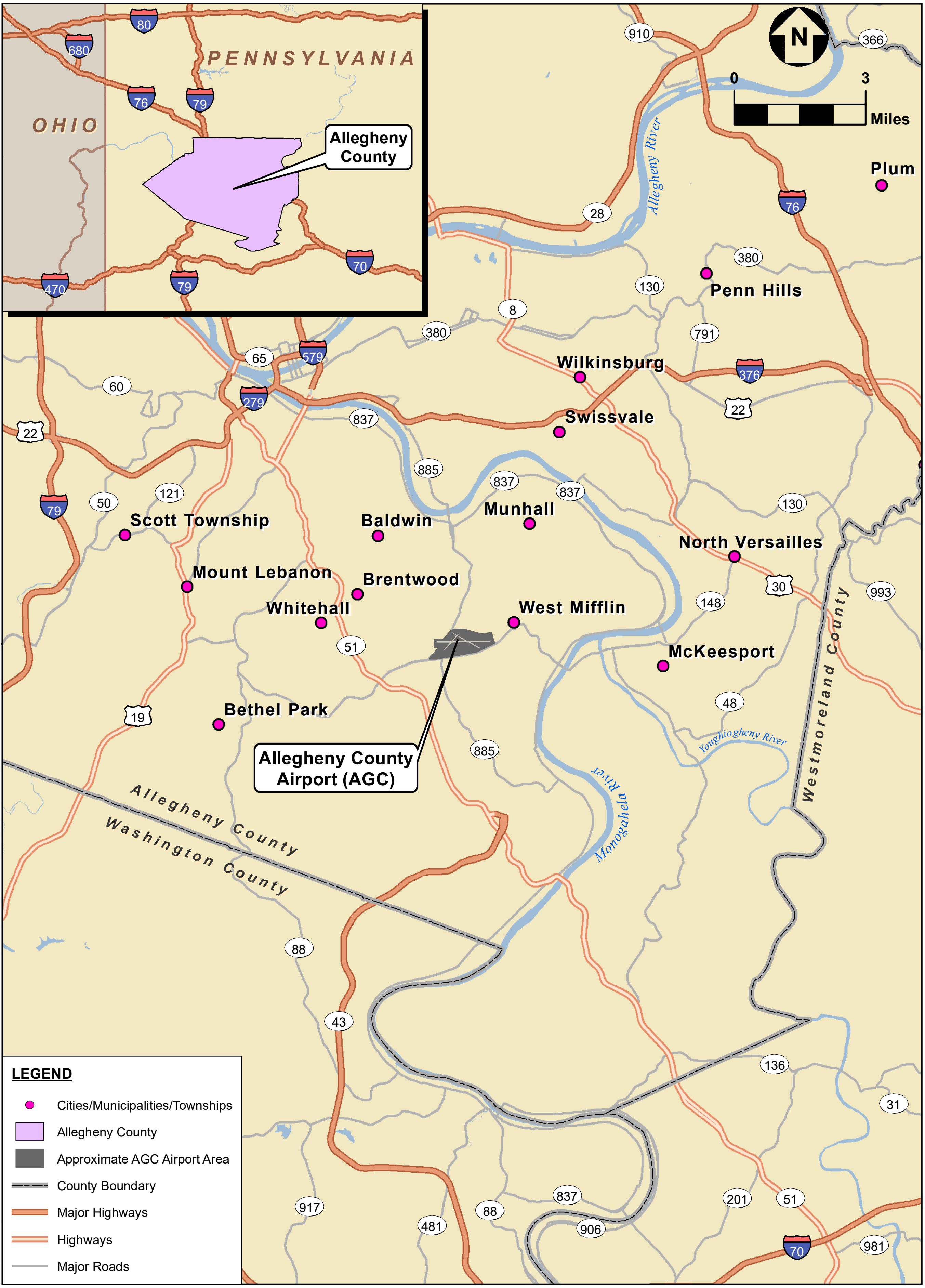
[4] *Report to Congress, National Plan of Integrated Airport Systems 2021-2025.* FAA, September 30, 2020.

[5] *AirNav*, 2020. *KAGC, Allegheny County Airport, Pittsburg, Pennsylvania, USA.* Retrieved in December 2020 at: http://www.airnav.com/airport/kagc

[6] An aircraft operation is defined as one takeoff or one landing of an aircraft.

[7] *FAA, FY 2020 to 2045 Terminal Area Forecast*, issued May 2021.



Source: Esri; ESA, 2020

Allegheny County Airport Environmental Assessment

FIGURE 1-1
AIRPORT LOCATION
ALLEGHENY COUNTY AIRPORT

TABLE 1-1
FAA TERMINAL AREA FORECAST SUMMARY – AGC

YEAR	Itinerant Operations			Local Operations		TOTAL
	Air Carrier & Air Taxi	General Aviation	Military	General Aviation	Military	
Historic Activity						
2009	19,370	32,161	506	17,889	148	70,074
2010	18,473	30,989	416	18,289	79	68,246
2011	18,212	30,055	423	15,680	154	64,524
2012	18,046	29,098	325	12,538	194	60,201
2013	19,635	27,919	454	14,202	88	62,298
2014	17,403	24,992	405	12,046	207	55,053
2015	17,340	23,782	235	9,882	228	51,467
2016	20,251	23,299	312	10,231	110	54,203
2017	22,861	25,389	318	13,418	186	62,172
2018	22,885	24,068	318	10,836	62	58,169
2019	19,644	24,224	245	14,744	58	58,960
2020	17,967	22,314	245	13,177	44	53,747
Projected Activity						
2021	18,302	22,419	245	14,378	44	55,388
2022	18,637	24,221	245	14,378	44	57,525
2023	18,974	25,481	245	14,896	44	59,640
2024	19,309	25,481	245	14,896	44	59,975
2025	19,644	25,481	245	14,896	44	60,310
2026	19,792	25,481	245	14,896	44	60,458
2027	19,943	25,481	245	14,896	44	60,609
2028	20,094	25,481	245	14,896	44	60,760
2029	20,245	25,481	245	14,896	44	60,911
2030	20,398	25,481	245	14,896	44	61,064
2031	20,551	25,481	245	14,896	44	61,217

SOURCE: FAA, *2020 Terminal Area Forecast*, issued May 2021; note this forecast is compatible with the preferred operations forecast given in the AGC 2017 Master Plan Update, which was derived from the FAA 2017 TAF.

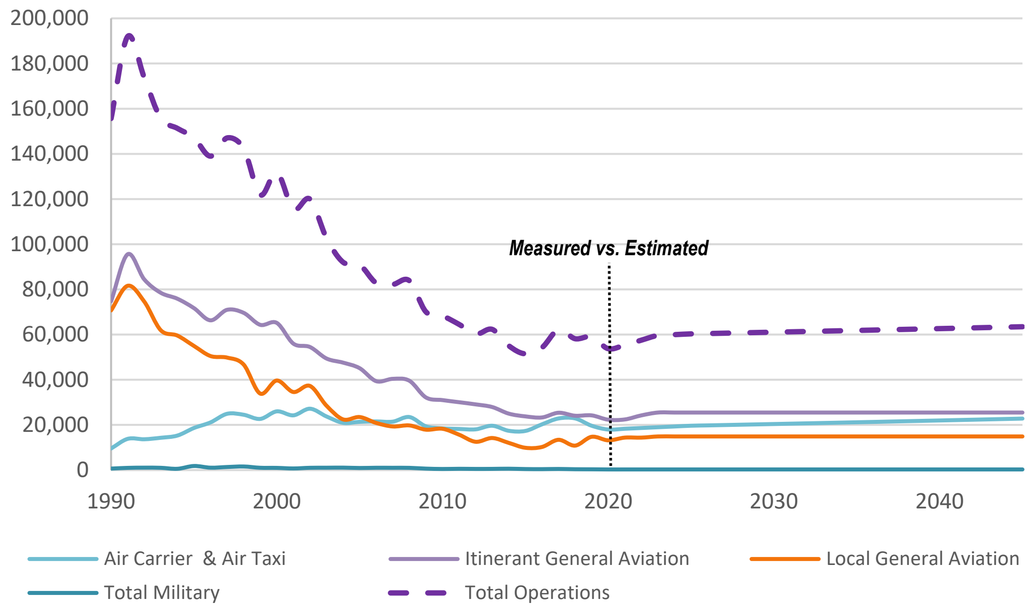


Figure 1-2
AGC Operations, 1990 to 2045

1.3 Purpose and Need for the Proposed Project

An RSA is a rectangular area surrounding a runway that is designed to enhance the safety of aircraft that undershoot, overrun, or otherwise leave the paved runway surface.[8] An airport must keep the RSA cleared, graded, drained, and accessible by firefighting and rescue equipment.[9] RSA standards and dimensions are defined by the FAA based on the type of aircraft using the airport. In situations where land is not available or if existing obstacles make a standard RSA impossible, the FAA works with the airport to find alternative solutions. FAA regularly re-evaluates standard and non-standard RSAs and requires incremental improvements as applicable. Both Runways 10-28 and 13-31 have non-standard RSAs. The rationale for the selection of Runway 10-28 as the primary focus of this EA is detailed in Chapter 2.

For Runway 10-28, a standard RSA would extend 1,000 feet from the departure end of the runway, be 500 feet wide, and have no more than 3 percent slope for 200 feet off the runway end and at maximum 5 percent thereafter (**Figure 1-3**).[10] However, a standard RSA for Runway 10-28 at AGC is not feasible. The RSA has been determined by previous studies and airport master plans to be 1,000 feet short on the Runway 10 (western) end and 793 feet short on the Runway 28 (eastern) end, and, in some areas, steeper than the FAA standards. The area off the Runway 10 end has an

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[8] FAA, 1999. *Order 5200.8: Runway Safety Area Program.* October. And FAA, 2004. *Order 5200.9, Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*

[9] FAA 2012. *Advisory Circular (AC) 150/5300-13A-Airport Design* and 2019 *Errata Sheet for AC 150/5300-13A, Airport Design, Consolidated Change 1*, accessed in January 2021 at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13A-chg1-interactive-201612.pdf

[10] Runway 10-28 is the Airport's primary runway and is a D-III runway, with the Gulfstream V designated as the critical aircraft. The runway is also commonly used by Gulfstream IV and Bombardier Challenger 600 aircraft. (FAA, 2005.*Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design*)

approximately 20 percent slope, and the area off the Runway 28 end has a 7.6 percent slope. There is also development around the runway within the dimensions of a standard RSA that cannot be reasonably relocated, such as the highways, railroad, landfill, and residential developments. Both the Railroad and State Highway 885 run through a tunnel underneath Runway 10-28.

The purpose of the Proposed Project is to improve the Runway 10-28 RSA to meet standards and safety requirements in accordance with FAA Order 5200.8, *Runway Safety Area Program*. The project is needed as AGC does not currently offer a runway with a standard RSA for runways serving the types of aircraft that typically access the airport. If no improvements are made to AGC RSAs, the current situation means that non-compliance with FAA safety standards and increased risks to aircraft using the airport would persist.

Figure 1-3
Runway 10-28 Standard RSA Deficit (red)

1.3.1 History of Improvements to the Runway 10-28 RSA

Accidents occurred on Runway 10-28 prior to 1998, and the 1998 Airport Master Plan identified the deficiencies and called for RSA improvements at AGC. The first aircraft overrun occurred in 1984. A second overrun occurred in January 1998, when a jet on an executive/corporate flight in rainy, foggy conditions overran Runway 10-28 at AGC, coming to a stop at the edge of an adjacent mobile home park.[11] The airplane and two mobile homes were destroyed by fire (there were no fatalities).

ACAA has regularly revisited alternatives or new technologies to maintain and improve aircraft safety in this area. In order to simplify this document, the studies listed below are summarized or incorporated by reference into this EA as relevant.

- Environmental Site Assessment (2001) for the acquisition of three West Mifflin Motors parcels within the RSA boundary along Lebanon Church Road (2-3 acres).[12] The acquisition of these properties and relocation of these services removes incompatible uses from crucial aircraft

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[11] Bureau of Aircraft Accidents Archives, 2001, Pittsburgh-Allegheny County: Crash of a Cessna 500 Citation I in Pittsburgh. Accessed in May 2021 at: https://www.baaa-acro.com/city/pittsburgh-allegheny-county

[12] ACAA, 2001. *Phase I Environmental Site Assessment for AGC Runway 28 Project, West Mifflin Motors*, September. Prepared by McFarland-Johnson, Inc.

safety areas and increases safety for both aircraft users and private business owners and customers.

- EA (2002) to evaluate alternatives for improving the Runway 28 RSA and Runway Object Free Area.[13] The Finding of No Significant Impact associated with this EA proposed the acquisition of Broscius Trailer Park property within the Runway 28 RSA, Runway Object Free Area, and other, landlocked property (65 mobile homes / 12.97 acres) at the end of the runway; the acquisition of the West Mifflin Motors parcels; and grading in critical areas adjacent to the Runway. This study ultimately resulted in the purchase of properties and relocation of homes and businesses within the Runway 28 RSA.

- Runway 10 RSA Study (2004)[14] and Addendum (2005)[15] evaluated alternatives to improving the Runway 28 RSA and Runway Object Free Area. The Study recommended fill be placed within the Runway 10 RSA up to the Airport property line to correct steep slopes in that area. The FAA approved a nonstandard RSA, and these alternatives were included in the 2006 Airport Master Plan Update and Airport Layout Plan.

- AGC 2017 Master Plan Update, Appendix D[16] evaluated RSA alternatives to address the nonstandard conditions of Runway 10-28. These alternatives are discussed further in Section 2.2.

1.4 Description of the Proposed Project

1.4.1 Description of Construction Activities

The Proposed Project is largely comprised of the preferred alternative elements described in the 2017 AGC Airport Master Plan Update (**Figure 1-4**). The Proposed Project would place fill material (clean dirt or stone) in three distinct areas on airport property in the Runway 10-28 RSA, including mid-runway and at both ends of the runway. This fill would correct the nonstandard slope in all three areas and would correct the width in the mid-runway location and for approximately 335 feet at each runway end. An Engineered Material Arresting System (EMAS), designed specifically for AGC to compensate fully for the remaining RSA length deficits, would also be installed at both ends of the runway.[17]

An Engineered Material Arresting System (EMAS) is akin to an emergency runaway truck ramp on a highway. It uses crushable material placed at the end of a runway to stop an aircraft that overruns the runway. The tires of the aircraft sink in and the aircraft is decelerated. To date, EMAS is successfully operating at 115 runway ends at 67 airports in the United States.

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[13] ACAA, 2002. *Final Environmental Assessment for Allegheny County Airport Runway 28 Safety Area and Object Free Area Improvements*, January. Prepared by McFarland-Johnson, Inc.

[14] ACAA, 2004. *Runway Safety Area Study*, June. Prepared by Maguire Group, Inc.; Landrum & Brown, Inc.; Michael Baker Jr., Inc.; and Sci-Tek Environmental Services Co.

[15] ACAA, 2005. *Addendum to Runway 28R and Runway 14-32 Final Runway Safety Area Improvement Study and Determination*, June. Prepared by Michael Baker Jr., Inc.

[16] *Allegheny County Airport 2017 Master Plan Update*. Prepared by McFarland Johnson for Allegheny County Airport Authority.

[17] FAA, 2021. Fact Sheet – *Engineered Material Arresting System (EMAS)*. Accessed in November 2021 at: https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=13754

The design, installation, and maintenance of the EMAS system is controlled by criteria established by the FAA.[18] The EMAS bed is comprised of a single layer of up to 4 feet by 4 feet blocks that crush and move under the weight of the aircraft.[19] In traditional EMAS systems, these blocks have a core of crushable concrete and are covered in foam and sealed with plastic and nylon to ensure durability against jet blast and climate. Caulk or tape is applied as appropriate to seal the spaces between the blocks. A green version of the blocks uses silica from recycled glass anchored within a high-strength plastic mesh system and coated with cement and sealant. Prior to block installation, the EMAS bed is graded and paved and vents are installed around the system for drainage purposes. Snow removal is not necessary or typically performed as the EMAS is designed to prevent water from accumulating on the surface, but any requirements or limitations would be specifically addressed in the FAA-approved EMAS inspection and maintenance program.[20]

Other related improvements include re-routing service roads; relocating airport, utility, and other infrastructure that would be impacted by the fill; and establishing stormwater management features to support the new areas as necessary. Preliminary engineering and design studies estimate the details of these actions as follows:

Expand the Runway 10 RSA

- Install fill to extend RSA 335 feet and widen 500 feet across the new length. Taper from new RSA elevation to existing elevation at a 2:1 slope.[21] Approximately 442,467 cubic yards of fill would require 24,582 dump truck trips (standard triaxle dump truck capacity is 18 cubic yards).
- Install a 300-foot by 150-foot EMAS bed

Expand the Runway 28 RSA

- Install fill to extend RSA 335 feet and widen 500 feet across the new length. Taper from new RSA elevation to existing elevation at a 2:1 slope. Approximately 61,239 cubic yards of fill would require 3,403 standard dump truck trips.
- Install a 300 foot by 150-foot EMAS bed

Expand a Portion of the mid-Runway RSA

- Install 55,000 cubic yards of fill. Approximately 54,002 cubic yards of fill would require 3,001 standard dump truck trips.

Other Improvements

- Remove existing, 10-foot-wide dirt airport service roads within the fill footprint
  - Runway 10 end: 1,800 linear feet
  - Runway 28 end: 4,370 linear feet
  - Mid-Runway: 2,630 linear feet

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[18] FAA, 2012. Advisory Circular 150/5220-22B, *Engineered Materials Arresting Systems for Aircraft Overruns*
FAA, 2014. Advisory Circular 150/5300-13A, *Chapter 307. Runway Safety Area / Engineered Materials Arresting Systems.*

[19] Runway Safe, 2021. *EMASMAX Engineered Material Arresting System.* Accessed September, 2021 at: https://runwaysafe.com/references/

[20] FAA, 2017. Advisory Circular 150/5220-16E, *Automated Weather Observing Systems for Non-Federal Applications, with Change 1.*

[21] In some specific, localized areas, the slope may be increased to 1.5:1 in order to avoid impacts to adjacent resources.

- Establish new, 10-foot-wide dirt airport service roads to reconnect existing airport service road system
  - Runway 10 end: 1,920 linear feet
  - Runway 28 end: 460 linear feet (250 to the north, 210 to the south)
  - Mid-Runway: 1,180 linear feet
- Relocate or extend groundwater monitoring wells within fill footprint at Runway 10 end; relocate existing utility pipeline at the Runway 28 end.
- Relocate airport boundary fence at both ends of the runway along fill/new service roads.
- Relocate FAA sheds, instrument landing system, medium approach light system with runway alignment indicator lights system, and localizer array, at end of Runway 28, and runway end identifier lights at the Runway 10 end.
- Modify the existing airport stormwater management system as necessary to accommodate the Proposed Project. Further engineering of stormwater management features will be the result of ongoing site planning and permitting processes, but may include the relocation and installation of ditches, swales, and culverts channeling stormwater into existing retention ponds.
- Clear trees and vegetation and remove objects within the Proposed Project footprint. This includes 36 acres at the Runway 10 end and 48 acres at the Runway 28 end and mid-runway location. The cleared and graded areas would be replanted to minimize erosion and the RSA area would be maintained as pavement and grass per EMAS design guidelines.

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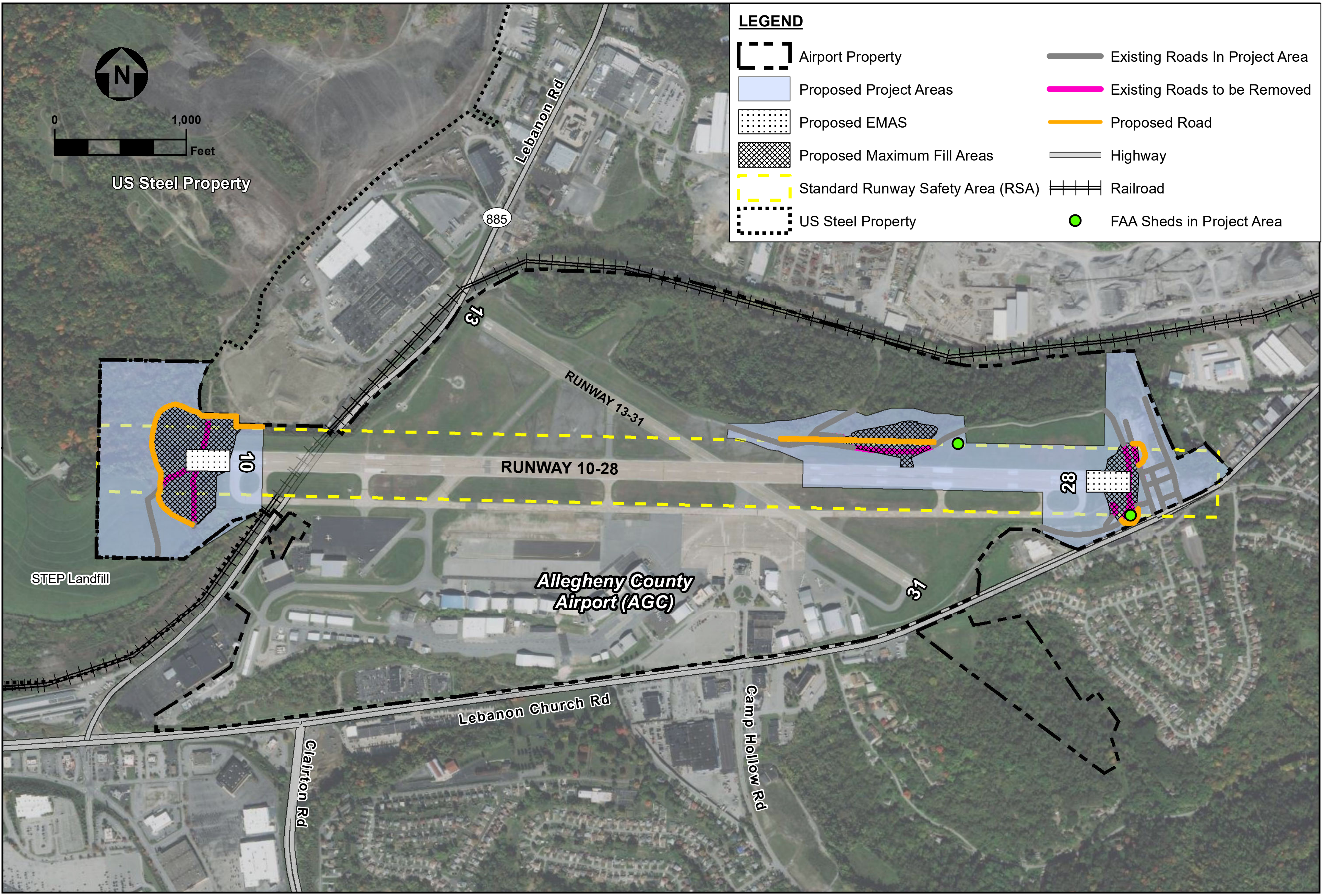

Source: Esri; GAI; Adapted by ESA, 2021.

FIGURE 1-4
PROPOSED PROJECT STUDY AREAS

1.4.2 Project Costs and Funding

The conceptual cost estimate for the development of the Proposed Project is approximately $39.6 million (**Table 1-3**). The ACAA is seeking FAA funding for certain project elements determined to be eligible under the Airport Improvement Program.[22] Note that stormwater modifications will be implemented as designed in association with each individual, site-specific project element and are not itemized separately.

TABLE 1-3
CONCEPTUAL PROJECT COST

Action	Estimated Costs
Runway 10 End	
EMAS	$6,000,000
Earthwork (fill)	$12,200,000
New Roads / Fence / Utilities / Stormwater Management / Erosion and Sediment Control	$545,000
Well Abandonment / Replacement	$300,000
Runway 28 End	
EMAS	$6,000,000
Earthwork (fill)	$2,000,000
New Roads / Fence / Stormwater Management / Erosion and Sediment Control	$355,000
FAA Facilities	$1,000,000
Mid-Runway 28	
Earthwork (fill)	$1,900,000
New Roads / Fence / Stormwater Management / Erosion and Sediment Control	$335,000
Additional	
Engineering	$3,875,400
FAA Review	$100,000
Construction Management	$5,000,000
TOTAL	**$39,610,400**

SOURCES: GAI, 2021; AGC 2017 Master Plan Update, Appendix D

1.4.3 Conceptual Project Implementation Schedule

The anticipated progression of the project includes concurrent engineering and project design work as the NEPA process is concluded. Assuming the Proposed Project is approved and adequate funding is available, construction activities are anticipated to begin in 2023. The Proposed Project would be completed in 2026 and the Airport would return to regular operations. Note that

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[22] This EA provides information necessary for the FAA to fulfill its obligations under NEPA. Any decisions, determinations, and environmental approvals related to this EA do not signify an FAA commitment to provide financial support for the Proposed Project. A funding commitment can only be made if, and when, AGC submits a grant application for a specific, eligible project and FAA's consideration of the separate Federal funding criteria prescribed by 49 USC 47115(d) and 49 USC 40117.

stormwater modifications will be implemented as designed in association with each individual, site-specific project element and thus are considered within each project element's timeline.

1.4.4 Permits Required

Permits that may be required to implement the Proposed Project are listed **Table 1-4**.

TABLE 1-4
SUMMARY OF POTENTIALLY REQUIRED PERMITS AND APPROVALS

Permit	Lead Agency	Status	Responsible Entity
Federal			
Clean Water Act Section 404 Streams (unlikely)	Joint U.S. Army Corps of Engineers and Pennsylvania Department of Environmental Protection	If deemed necessary, permit required prior to construction	Allegheny County Airport Authority
State			
National Pollutant Discharge Elimination System (NPDES)	Pennsylvania Department of Environmental Protection	Permit required prior to construction	Allegheny County Airport Authority
Local			
Local Construction Permits	Allegheny County / Borough of West Mifflin	Permits required prior to construction	Construction Contractor

1.5 Federal Involvement

1.5.1 FAA's Role

Airport Sponsors are required to seek FAA approvals necessary to implement proposed airport development projects and may also request federal funding for eligible projects under the Airport Improvement Program.[23]

The FAA's statutory mission is to ensure the safest, most efficient operation of the airport and airway system pursuant to Title 49, United States Code (U.S.C.) § 47101. The FAA accomplishes this mission, in part, through the review and approval of proposed airport development projects. This purpose of this process is to ensure compliance with safety, operational, airspace, and airport design standards. Implementation of the Proposed Project at AGC would result in a need for the FAA to review and approve the proposed RSA improvements.

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[23] An airport sponsor is an airport, typically represented by an airport director, that has received FAA grants and is subject to Federal grant assurances. Paragraph 201(a) of FAA Order 5050.4B, states "airport sponsors are responsible for deciding when and where airport development is needed and for building and operating airport facilities."

1.5.2 Requested Federal Actions

The specific federal actions under consideration through this EA include:

1. Conditional approval of those portions of the *AGC Airport Layout Plan* that may depict components of the Proposed Project pursuant to 49 U.S.C. §§ 40103(b), 44718, and 47107(a)(16), and Title 14 Code of Federal Regulations (CFR) Part 77.
2. Determination of eligibility for federal assistance under the federal grant-in-aid program authorized by the *Airport and Airway Improvement Act of 1982*, as amended (49 U.S.C. § 47101, *et seq*.).
3. Approval of further processing of an application for federal assistance for eligible components of the Proposed Project as shown on the Airport Layout Plan, using federal funds from the Airport Improvement Program.

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CHAPTER 2
Alternatives

2.1 Screening Criteria

The alternatives screening process identifies, compares, and evaluates reasonable alternatives for the Proposed Development Project (as defined in Section 1.4). Screening criteria considers whether the potential alternative meets the purpose and need, is constructible, and avoids significant impacts to existing land uses, the environment, and airport operational efficiency. Screening criteria includes the following considerations:

- **Provide a Runway with an Acceptable RSA at AGC:** meets safety requirements as established by FAA for protection of existing users in the event of accidental overshoot of existing AGC runways.
- **Land Use:** avoids existing land use constraints that would interfere with safe and efficient aircraft operations or would cause significant community disruption, such as incompatible private or public lands. Constraints are identified in Section 1.2.1 and include adjacent highways, railroad, landfill, and residential developments.
- **Constructability:** does not have unreasonably high construction costs, is buildable/feasible, and can be completed without substantial impacts to daily airport operations.
- **Environmental Impacts:** avoids or minimizes environmental impacts.
- **Operational Efficiency:** supports the ongoing safe, organized, and effective use and movement of aircraft and aviation support services.

Alternatives that did not meet the evaluation criteria were eliminated from further consideration and were not subject to a detailed analysis of environmental impacts in this EA. As required under 40 CFR § 1502.14(d), the No Action Alternative was advanced through the alternatives analysis as a basis of comparison against which the impacts of the other alternatives were evaluated.

2.2 Alternatives Considered

Since 2001 and in coordination with FAA, AGC has evaluated a substantial number of alternatives for improving the RSA (Section 1.3.1). Many alternatives for airport improvements have been developed, considered, and dismissed in preceding environmental analysis documents, and these alternatives are summarized herein. Graphics depicting these alternatives are excerpted from the 2017 AGC Master Plan Update and available in **Appendix A**.

2.2.1 Improve Other Runways at AGC

This alternative considered improving Runway 13-31 and downgrading Runway 10-28 so fewer aircraft are exposed to risks associated with the Runway 10-28 non-standard RSA. Runway 13-31 would become the primary instrument runway at AGC (shifting service from Runway 10-28). Runway 13-31 would be widened and extended 2,676 feet and a parallel taxiway would be constructed.[24] Additionally, this alternative would require a tunnel for part of Lebanon-Church Road ($30M) and the acquisition of 70 residences along Glencoe Drive ($10.5M). This alternative would not avoid existing land use constraints and would be cost prohibitive and operationally inefficient and thus is dismissed from further consideration.

2.2.2 Use of Declared Distances

Declared distances are specific operational lengths designated at a given airport for pilots to understand the appropriate takeoff and landing weight and speed for their aircraft. Where the reduction of usable runway length is necessary, airports can designate a displaced threshold, which marks the extent of usable runway located at a point other than the physical beginning of the runway. For Runway 10-28 to meet full standard RSA requirements without physically improving the RSA, displaced thresholds of 1,551 feet and 2,508 feet would be required for Runway 10 and 28, respectively.[25] To accommodate a partial standard RSA (dismissing the mid-Runway 28 nonstandard RSA) and accommodate at least 600 feet of RSA prior to each landing threshold, the Runway 10 approach end would require a displaced threshold of 490 feet and the Runway 28 approach end would require a displaced threshold of 413 feet. The resulting Takeoff Run Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA), and Landing Distance Available (LDA) for displaced thresholds that support both full and partial RSA are shown in **Table 2-1**.

TABLE 2-1
RUNWAY 10-28 DISPLACED THRESHOLD AND DECLARED DISTANCES TO ACCOMMODATE FULL AND PARTIAL RSA

Runway End	Displaced Threshold (feet)	TORA (feet)	TODA (feet)	ASDA (feet)	LDA (feet)
Full RSA					
10	1,551	6,501	6,501	3,592	2,041
28	2,508	6,501	6,501	4,549	2,041
Partial RSA					
10	490	6,501	6,501	5,686	5,195
28	413	6,501	6,501	5,608	5,195

SOURCE: Matrix is reproduced from McFarland Johnson, 2017. *Allegheny County Airport 2017 Master Plan Update*.
Distances are as defined in AC 150/5300-13A for displaced thresholds.

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[24] ACAA, 2002. *Final Environmental Assessment for Allegheny County Airport Runway 28 Safety Area and Object Free Area Improvements*, January. Prepared by McFarland-Johnson, Inc.

[25] *Allegheny County Airport 2017 Master Plan Update*. Prepared by McFarland Johnson for Allegheny County Airport Authority.

As shown in **Table 2-1**, declared distances on Runway 10-28 would substantially reduce the effective useable runway length. In the Full RSA scenario, the remaining available length would prohibit use of the runway by the critical design aircraft, which has been approved by FAA through detailed forecasting analysis in the 2017 Master Plan Update process as the appropriate user group of this airport. In the Partial RSA scenario, the critical design aircraft would not be able to land in wet conditions and would encounter substantial payload restrictions in dry conditions. Thus, as AGC would no longer be able to serve the aircraft it was designed for, this alternative is considered operationally infeasible and is dismissed from further consideration.

2.2.3 Modify Runway 10-28

Several alternatives have considered the relocation, shift, realignment, or reduction of Runway 10-28. There is no available land at AGC to relocate Runway 10-28, and any shift or realignment would encounter the same RSA constraints that exist for the current configuration (landfill, highway/ railroad, residences, slope, and dropoff, etc.) as well as encroach on contributing elements to the National Register of Historic Places Historic District designation at AGC. Reducing the runway length is operationally infeasible as the Runway is already marginally long enough to serve the aircraft it was designed for.[26] This alternative does not avoid land use constraints, would have higher construction costs than the Proposed Project, and would be operationally inefficient and thus it is dismissed from further consideration

2.2.4 Fill Runway 10-28 Safety Area

Numerous engineered alternatives have looked at the varying extent of fill required to correct the Runway 10-28 RSA. All of the following alternatives provide a runway with an acceptable RSA, but have varying affects to adjacent land uses and have additional constructability considerations. Note that these alternatives are specific to the Runway 10-28 ends; no feasible action alternative to the minimal mid-runway fill is proposed for that location and it will be carried forward for full analysis.

Fill Entire Standard RSA. This alternative (500 feet wide for 1,000 feet at each runway end) is constrained at the Runway 10 end by the location of the landfill (i.e., extending a 500-foot RSA for a full 1,000 feet would require fill be placed on top of the existing landfill), which risks potentially impacting the integrity of the landfill. Due to slope requirements outside of the 500-foot width, it would also require the existing Lebanon Road/Highway 885 and rail tunnel be extended and the acquisition of properties at this location. At the Runway 28 end, a tunnel for Lebanon Church Road would be required involving further substantial cost and property acquisition. As this alternative would cost considerably more, introduce a number of constructability challenges, and have greater potential environmental and land use impacts than the Proposed Project, it was dismissed from further consideration.

Fill to Property Line. The airport property at the Runway 10 end could accommodate a 1,000-foot by 500-foot RSA; however, part of this land is leased to the landfill and is known to contain hazardous material, and placing fill on top of it may have unknown environmental impacts.

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[26] Full operational analysis per *FAA AC 150/5325-4B, Runway Length Requirements for Airport Design*, is available in the 2017 AGC Master Plan Update. Runway 10-28 is a D-III runway, and the Critical Design Aircraft is the Gulfstream V (also commonly used by Gulfstream IV and Bombardier Challenger 600).

Additionally, to keep the entire project within airport boundaries would require an extensive, 3,165-foot long by 170-foot-high retaining wall and extension of the existing Lebanon Road tunnel. At the Runway 28 end, the RSA would be 500 feet wide for 485 feet and partial width for 515 feet. This alternative would construct an 880-linear foot, 20-foot-high retaining wall along Lebanon Church Road and require the acquisition of 3 residential properties at the Runway 28 end (3 acres). Avoiding the land acquisition would require a 1,475 by 50-foot retaining wall. As this alternative would cost considerably more, introduce a number of constructability challenges, and have greater potential environmental and land use impacts than the Proposed Project, it was dismissed from further consideration.

2.2.5 Installation of EMAS (Proposed Project)

Installing an EMAS bed at each end of the runway would slow down aircraft that overrun the runway more quickly; therefore, the RSA does not need to be as long. The EMAS proposed at the Runway 10-28 ends would be 300 feet long and 150 feet wide off the end of the existing pavement. Fill will still be required to construct the EMAS due to the steep slopes at both runway ends; however, most of the fill can be placed at approximately a 2:1 slope and, based on engineering design analysis that occurred subsequent to a Geotechnical Survey prepared for this alternative, it is anticipated that these slopes would avoid the landfill at the Runway 28 end without the need for a retaining wall. The drawings constituting the engineering design analysis are provided in **Appendix E**. Further site characterization and engineering is ongoing concurrent with this analysis, but preliminary geotechnical tests have determined that this alternative is constructible and can largely avoid impacts to land use and potentially significant environmental risks. Because it avoids land use constraints and minimizes the total fill required (and thus is also considerably less expensive than other possible solutions), this alternative is carried forward for detailed evaluation in this EA.

2.2.6 No Action Alternative

Under the No Action Alternative, the Proposed Project would not be built, including clearing; the placement, compaction, and grading of fill; and EMAS construction. All existing RSAs at AGC would continue to be non-standard and aircraft that overrun the runway would be at greater risk for damage and injury.

This Alternative does not meet the purpose and need, but it is carried forward for analysis purposes as required under 40 CFR § 1502.14(d) as a basis of comparison against which the impacts of the other alternatives can be compared.

2.2.7 Designation of Preferred Alternative

The ACAA designates the installation of EMAS at both ends of Runway 10-28 as the Preferred Alternative for the Proposed Project. This Alternative meets the purpose and need in an operationally efficient manner with no encroachment into adjacent land uses, no apparent significant environmental or operational impacts, and is more economic than other alternatives. Only the Proposed Project Alternative, as described in Section 1.4.1 and Section 2.2.5, is carried forward for full analysis.

Table 2-2 summarizes the results of alternative evaluation against the screening criteria.

TABLE 2-2
ALTERNATIVES SCREENING CRITERIA EVALUATION

Alternative	Provide Runway with Acceptable RSA	Avoids Land Use Constraints	Constructible and Cost Effective	Avoids Obvious and Significant Environmental Impacts	Operationally Efficient	Carried Forward for Further Analysis
Improve Runway 13-31 Instead[1]	N	N	N	Y	N	N
Use Declared Distances[2]	N	Y	Y	Y	N	N
Modify Runway 10-28	Y	N	N	N	N	N
Fill Entire Runway 10-28 RSA[2]	Y	N	N	N	Y	N
Fill RSA to AGC Property Line[2]	Y	N	N	N	Y	N
Install EMAS[2]	Y	Y	Y	Y	Y	Y
No Action	N	Y	Y	Y	Y	Y

SOURCES:

[1] ACAA, 2002. Final Environmental Assessment for Allegheny County Airport Runway 28 Safety Area and Object Free Area Improvements, January. Prepared by McFarland-Johnson, Inc.

[2] *Allegheny County Airport 2017 Master Plan Update*. Prepared by McFarland Johnson for ACAA.

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CHAPTER 3

Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the existing natural and human environment and potential impacts of the Proposed Project. The purpose of environmental analysis is to determine whether impacts resulting from the implementation of a proposed project would exceed a threshold level of significance for each resource.

3.1.1 Study Area

The study area defined for the Proposed Project includes all areas that may be directly or indirectly impacted by construction or ongoing maintenance activities. The Proposed Project study area accommodates the *project footprint* (portions of the AGC runway and taxiway safety zones, maximum fill area, construction lay down areas, and extents of potential service road relocation) and a *project area* buffer of airport property adjacent to the footprint (**Figure 1-4**). The study area is shaded grey in **Figure 1-4** and relevant analysis maps throughout this document. The analysis for most resources considers the affected environment within the Proposed Project study area but may be further scaled as appropriate to the individual resource as discussed in the corresponding resource analysis section. Terms used in this EA are defined as follows:

- *Project Footprint:* when used in this document, this term refers to the maximum anticipated area of ground disturbance and establishment of persistent airport amenities (e.g., where fill and roads would be placed plus a 25-foot buffer to accommodate any temporary impacts from construction and ongoing maintenance).
- *Project Area*: includes locations directly adjacent to the project footprint that may be indirectly impacted, or that may include negligible direct impacts currently unforeseen but encountered as final design plans and construction occur. The project area acts as an envelope that would capture a maximum boundary of potential actions and provide a conservative analysis of related impacts. The evaluation of a greater project area ensures that project design, buffers, and other best practices are established where appropriate so potential impacts do not migrate offsite and affect known adjacent resources in the vicinity of the project.

3.1.2 Measuring Environmental Impacts

Potential impacts are quantified where possible and discussed at a level of detail necessary to determine the significance of the impacts. Impact significance was evaluated per FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and associated Desk Reference and according to NEPA implementing regulations at 40 CFR Section 1508.27, which requires considerations of both context and intensity. This environmental consequences analysis considers all potential environmental impacts of the initial clearing, placement and compaction of fill, construction of EMAS bed, and relocation of service roads and utilities; implementation or use of the improved RSA; and ongoing maintenance.

3.1.3 Measuring Cumulative Impacts

While this section identifies other actions that may impact the same resources as the Proposed Project, the analysis of cumulative effects from the Proposed Project is further considered specific to relevant resources and summarized in the respective resource section of this chapter.

3.1.3.1 Definition of Cumulative Impacts

CEQ regulations require federal agencies to assess the effect on the environment that results from the incremental effect of the proposed action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. CEQ and the USEPA have published guidance addressing implementation of cumulative effect analyses, including *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ 2005), *Consideration of Cumulative Effects in EPA Review of NEPA Documents* (USEPA 1999), and *Considering Cumulative Effects Under NEPA* (CEQ 1997). Chapter 15 of the FAA's Order 1050.1F Desk Reference also provides guidance on the analysis of cumulative impacts associated with proposed actions.

CEQ guidance identifies cumulative effects as those environmental effects resulting "from spatial and temporal crowding of environmental perturbations" whereas "the effects of human activities will accumulate when a second perturbation occurs at a site before the ecosystem can fully rebound from the effects of the first perturbation." [27] Cumulative effects analysis normally will encompass a region of influence or geographic boundaries beyond the immediate area of the proposed action, and a timeframe including past actions and foreseeable future actions, to capture these additional effects.

3.1.3.2 Determination of Significance

The determination of the relative significance of the proposed action's incremental impacts are "evaluated in terms of both the total threshold beyond which the resource degrades to unacceptable levels and the incremental contribution of the proposed action to reaching that threshold."[28] For a proposed action to have a cumulatively significant impact to an environmental resource, two conditions must be met. First, the combined effects of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the effects of the proposed action, must be significant. Second, the proposed action must make a measurable or meaningful contribution to that significant cumulative impact.

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[27] CEQ, 1997. *Considering Cumulative Effects Under NEPA*

[28] Id.

3.1.3.3 Relevant Past, Present, and Reasonably Foreseeable Future Actions

To determine which past, present, and reasonably foreseeable future actions could influence the resource areas carried forward for further analysis, several factors were considered. These factors include project locations, the extent of environmental effects, likely future actions, and the project's relative contribution to cumulative effects on a specific environmental resource. If no such potential relationship exists, the project was not carried forward into the cumulative impacts analysis.[29]

For purposes of identifying potential cumulative impacts, projects in the Airport environs that occurred in the recent past, current projects, and reasonably foreseeable future projects within the next five years were selected for further analysis. Past projects are defined as those projects that have undergone NEPA review by the FAA and/or have been constructed within the past four years. Future projects are those projects that were identified by ACAA under the Airport Capital Improvement Program (ACIP) and have as yet not been reviewed under NEPA. The environmental impacts of these projects will be analyzed in separate documents, reviewed by the FAA, and by permitting/approval regulatory agencies, as applicable. These projects will be designed to avoid, minimize, and/or mitigate environmental impacts on Airport property. Local and regional activities have also been included in the cumulative impacts analysis because they occur near the Airport and, in combination with Airport projects, may have the potential for cumulative effects. These projects are likely not subject to NEPA review under the FAA, but may be analyzed under NEPA by other regulatory agencies.

Table 3.1-1 identifies the past, present, and reasonably foreseeable projects at the Airport and in the Airport environs that may produce temporary (construction-related) or ongoing (project-related) incremental effects to air quality, climate, wildlife, land use, noise, socioeconomics, surface transportation, natural resources, and surface water, that in combination with the effects of the Proposed Project would have the potential to result in cumulative impacts. For past actions, the cumulative impacts analysis only considers those actions or activities that have had ongoing impacts that may add to impacts of the Proposed Project. Likewise, present and reasonably foreseeable future actions selected for inclusion in the analysis are those that may have effects added to the effects of the Proposed Project as experienced by specific environmental receptors. The projects listed in **Table 3.1-1** are divided between Airport projects and local and regional projects set in the Airport environs.

Airport Projects

The AGC projects listed in **Table 3.1-1** are identified through ongoing Airport planning, including the AGC Master Plan Update, Airport Layout Plan, and the Joint ACIP. These plans and programs are intended to continually maintain airport assets, increase efficiency of airport operations, and, in some cases, foster the increased use of airport services. All Airport projects are reviewed for their potential to impact environmental resources.

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[29] CEQ, 2005. *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis.*

TABLE 3.1-1
PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE PROJECTS IN THE STUDY AREA

Action	Description	Year	Status
AGC Improvement Projects			
Past Projects			
Terminal and Hangar Restoration, Phase 1	Renovated Hangar 22 and Terminal	2018	Completed
Terminal and Hangar Restoration, Phase 2	Renovated first floor restrooms	2019	Completed
Terminal and Hangar Restoration, Phase 3	Installed utilities (HVAC, water, electricity, LED lighting, and alarm panel)	2020	Completed
Upper West Ramp Drainage and Pavement Improvements	Refined drainage system and improved pavement at apron; reconstructed vehicle service road; constructed entrance lanes and sidewalk and curb	2020-2021	Completed
Terminal Building Renovations	Renovated rooms in main terminal	2021	Completed
Present Projects			
Airfield Drainage Improvements	Drainage system refinement for Runway 10-28 and 13-31	2022	Under Construction
Airfield Joint, Crack Sealing and Pavement Rehabilitation	Taxiway A and Terminal Apron	2022	Under Construction
Airfield Signage Upgrades	Renovate to current standard	2022	Under Construction
Hangar 22 South Wall Repairs	Structural repairs	2022	Under Construction
Reasonably Foreseeable Future Projects			
Airfield Signage Upgrades	Renovate to current standard	2023	Planned
Airfield Pavement Joint Crack Rehabilitation	*Scope undefined*	2023	Planned
Hangar Redevelopment	*Scope undefined*	2023	Planned
Stormwater System Rehab	*Scope undefined*	2023	Planned
Hangar Redevelopment	*Scope undefined*	2024	Planned
Airfield Pavement Joint Crack Rehabilitation	*Scope undefined*	2025	Planned
Local and Regional Activities			
Present Projects			
Operation of US Steel property, including STEP	Ongoing remediation of contaminated areas. Ongoing operation of STEP landfill and treatment plant. Ongoing exclusion of development activities on US Steel property.	Ongoing	Ongoing
Lebanon Church Rehabilitation Project (PennDOT) - from Lebanon Church Road / Buttermilk Hollow intersection to 885 (Lebanon Road)	Rehabilitate pavement, widen road, and construct ADA sidewalk. Segment runs adjacent to AGC and access gates.	2022	Under Construction
Mon-Fayette Expressway / Turnpike 43 Project, segment 53B1A (Pennsylvania Turnpike Commission)	Total expressway construction includes 68-mile Toll Route 43 connecting PA Route 51 in Jefferson Hills to I-376 in West Virginia. EIS complete in 2004 and revisited in 2015. Segment will run through RPZ of AGC Runway 33.	2022	Under Construction
Reasonably Foreseeable Future Projects			
Route 885 Tunnel Structural Repairs (ACAA)	Tunnel under Runway 10-28	2025	Planned

Several of the Airport projects identified in **Table 3.1-1** were determined to be categorically excluded and it is presumed that they would not individually or cumulatively have a significant effect on the human environment and are thus eliminated from further analysis. Other projects identified in **Table 3.1-1** may produce negligible environmental effects that could combine with the effects of other projects in the surrounding area; however, due to the isolated scope and temporary duration of the projects and implementation of best management practices, the incremental impacts to affected resources are not anticipated to become cumulatively significant to any affected resource and thus are also eliminated from further analysis. In general, airport maintenance and improvement projects do not have significant environmental effects due to the type of project, the extent of the built environment in which the projects occur, and required compliance and mitigation in accordance with local, state, and federal regulations. It is important to note that some of the projects listed in **Table 3.1-1** improve or remove pavements and improve the airport stormwater system, which would have an ongoing beneficial impact to local resources such as soils and surface waters.

Local and Regional Projects

Regarding he local and regional projects identified in **Table 3.1-1**, there have been no past development projects within or adjacent to the study area that would be likely to produce effects that in combination with the minimal impacts anticipated from the Proposed Project would result in cumulative impacts. Similarly, present and reasonably foreseeable future projects are also not anticipated to contribute to cumulative impacts. The Proposed Project is situated in an industrial and commercial corridor and is adjacent to an existing landfill area and highway, which has ongoing environmental impacts to various environmental resources, which is further evaluated in specific resource sections of this chapter.

3.1.4 Resources Eliminated from Further Analysis

In accordance with CEQ regulations (40 CFR § 1502.15), resources upon which the Proposed Project is determined to have no effect do not warrant detailed examination. FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, identifies the environmental resource categories to be evaluated for potential effects associated with relevant FAA actions. The environmental resource categories that would not be affected by the Proposed Project include Coastal Resources; Department of Transportation Act, Section 4(f) resources; Farmland; and the Wild and Scenic Rivers subcategory of Water Resources. No impacts to these resources are expected, including incremental impacts that may intermingle with other activities and result in cumulative impacts within the greater landscape. The rationale for eliminating these resources from further detailed analysis is summarized below.

3.1.4.1 Coastal Resources

Coastal resources include those natural resources that occur within coastal waters and adjacent shorelands. Coastal zone management relates to specific additional protection of the rich natural, commercial, recreational, ecological, industrial, and aesthetic resources of the coastal zone through land use review and controls. In accordance with The *Coastal Zone Management Act* (16 U.S.C. §§ 1451-1466) Section 307 and 15 CFR part 930, subpart C, federal agency activities affecting a land or water use or natural resource of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state's coastal management program. The Pennsylvania Department of Environmental Protection (DEP) administers the Commonwealth Coastal Resources Management Program under the authority of Governor's Executive Order 1980-20.[30]

As Allegheny County and the Borough of West Mifflin are located over 100 miles from the Lake Erie Coastal Zone and 250 miles from the Delaware Estuary, and are not hydrologically connected to either area, the Proposed Project will not affect any land or water use within Pennsylvania's coastal zones. Thus, it is not necessary to evaluate compatibility of the Proposed Project with the Pennsylvania Coastal Zone Management Program, and these resources have been eliminated from further analysis.

3.1.4.2 Department of Transportation Act, Section 4(f)

Section 4(f) Resources include significant publicly-owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites (properties listed on or eligible for listing on the National Register of Historic Places). Section 4(f) of the *Department of Transportation Act of 1966* (codified at U.S.C. 49 § 303) provides that the Secretary of Transportation may approve a transportation project requiring use of these resources only if there is no feasible and prudent alternative to their use and the project is planned to minimize harm as much as possible resulting from that use.

There are no publicly owned parks, recreational areas, or wildlife or waterfowl refuges within 0.5 miles of the Proposed Project study area, and these types of resources would not be affected by any aspect of the Proposed Project. Portions of the Airport have been identified as being eligible for listing on the National Register of Historic Places; however, the Proposed Project is located fully outside of and not anticipated to have any impacts to the Historic District (Section 3.6). Thus, these resources have been eliminated from further analysis.

3.1.4.3 Farmlands

The *Farmland Protection Policy Act of 1981* (7 U.S.C. §§ 4201-4209) protects farmland defined as prime, unique, or of statewide or local importance from conversion to other uses. Prime, unique, and statewide and locally important farmland is defined in 7 CFR § 657.5. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor and without intolerable soil erosion. Unique farmland is land used for producing high-value food and fiber crops and has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of crops. Statewide and locally important farmland is land that has been designated as "important" by either a state government (state Secretary of Agriculture or higher office), by county commissioners, or by an equivalent elected body.

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[30] Pennsylvania DEP, Coastal Resources Management Program, 1999 with changes to 2003. *Commonwealth of Pennsylvania Coastal Resources Management Program Technical Guidance Document.*

There are no areas within the Proposed Project area that are identified as prime, unique, or statewide or locally important farmland,[31] and the Proposed Project does not involve land acquisition or the conversion of agricultural land to airport use; therefore, this resource has been eliminated from further analysis.

3.1.4.4 Water Resources (Wild and Scenic Rivers subcategory)

Wild and Scenic Rivers are rivers, tributaries, creeks, and small lakes, with adjacent land that possess outstanding scenic, recreational, and wildlife values, that are designated through the *Wild and Scenic Rivers Act* (1968) (16 U.S.C. §§ 1271-1287) to be preserved in free-flowing condition. An analysis of potential impacts may be necessary if a proposed action is located within one-quarter mile of the ordinary high-water mark on each side of a Wild and Scenic Rivers System river. The Nationwide Rivers Inventory is a register of river segments that potentially qualify for inclusion in the National Wild and Scenic River System. In order to be listed on the Nationwide Rivers Inventory, a river must be free flowing and possess one or more Outstanding Remarkable Values. Pennsylvania has 6 river segments, or 409.3 miles, designated as Wild and Scenic (0.05 percent of the state's river miles).

There are no designated Wild and Scenic Rivers segments and no river segments listed in the Nationwide Rivers Inventory in Allegheny County, and this resource has been eliminated from further analysis.[32]

3.1.5 Resources Considered in this EA

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, identifies environmental impact categories that the FAA examines for most of its actions. A total of 11 resource categories were evaluated for their potential to be impacted by the Proposed Project, including: air quality; biological resources; climate; hazardous materials and waste, solid waste, pollution prevention, and contaminated sites; historical, architectural, archeological, and cultural resources; land use; natural resources and energy supply; noise; socioeconomics, environmental justice, and children's environmental health and safety risks; visual effects; and water resources (wetlands, floodplains, surface waters, and groundwater subcategories only).

3.1.6 Summary of Potential Environmental Effects

Table 3.1-2 summarizes the potential environmental effects anticipated from implementation of the Proposed Project or No Action Alternative as identified and further discussed throughout Chapter 3.

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[31] US Department of Agriculture, Natural Resources Conservation Service, 2021. *Web Soil Survey*. Accessed in October 2021 at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

[32] *Nationwide Rivers Inventory,* National Park Service, 2021. https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977 accessed in October 2021. *Wild and Scenic River Database*, 2021. https://www.rivers.gov/pennsylvania.php accessed in October 2021.

TABLE 3.1-2
SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

Resource	No Action Alternative	Proposed Project
Air Quality	Existing conditions would persist. Air basin is in marginal nonattainment for 8-hour ozone and nonattainment for $PM_{2.5}$ and SO_2.	Temporary construction-related emissions would not cause or contribute to an exceedance of the NAAQS. Anticipated emissions increases over No Action during construction: • CO +40.93 • VOC +4.17 • NOx +36.42 • SOx +0.29 • PM_{10} +1.64 • $PM_{2.5}$ +0.81
Biological Resources – Vegetation and Habitat	Existing conditions would persist. AGC is located in a human-dominated, urban/industrial environment with very little natural or open space area available; although, the U.S. Steel Facility, U.S. Steel South Taylor Environmental Park (STEP), and a greenspace corridor are located adjacent to the study area to the west and north, and provide some habitat value in the greater landscape. Past fill operations, industrial setting, and ongoing disturbance has resulted in a highly altered upland community with significant nuisance/exotic species proliferation.	Proposed Project would remove 5.92 acres of degraded forest habitat. Slopes would be revegetated with a weed-free seed mix designed specifically to avoid attracting wildlife. If unmanaged, slopes may become a weed source. Removal of forested area would contribute incrementally to the general decrease of natural area in the greater landscape and reduction of the forested corridor north of the Runway 10 end.
Biological Resources – Wildlife	Existing conditions would persist. Wildlife species are relatively common within the vicinity of the airport and include those generally associated with and tolerant of highly disturbed, urban areas. There is ongoing potential for bird/wildlife encounters with aircraft. Wildlife is generally discouraged from utilizing Airport property (landing, nesting, loafing, and foraging) per the FAA-approved ACAA WHMP. No Critical Habitat or special status species are known at AGC. Indiana and Northern long-eared bats may be present in forested areas.	Most resident wildlife would be displaced by construction activities, likely migrating to adjacent natural areas. The Proposed Project would have No Effect on the Indiana and Northern long-eared bats; however, ACAA would consider performing tree clearing activities only from November 15 to March 31 to occur outside of bat nesting season. This time restriction would also minimize any impact or disturbance to migratory birds utilizing adjacent forest habitats. Incremental land use conversions across the region cumulatively have the long-term effect of shrinking viable wildlife populations.
Climate	Existing conditions would persist. AGC facility and aircraft support operations are in conformance with and in support of standards and goals established in *Pennsylvania Climate Change Act of 2008* and *The Pennsylvania Climate Action Plan* (2021). ACAA would continue to implement energy-saving strategies throughout its operations to help reduce and offset GHG emissions across the region. Ongoing GHG emissions are associated with fossil fuel combustion in support of ongoing facility and aviation operations at AGC.	AGC would continue to conform with and support local climate change planning initiatives. EMAS and related stormwater improvements would be designed to withstand impacts of climate change, including prolonged high temperatures and increased volume and intensity of precipitation events. Temporary construction-related GHG emissions: • +40,431 short tons CO_{2e}
Hazardous Materials and Waste, Solid Waste, and Pollution	Existing conditions would persist.	There would be a minimal increase in use and disposal of hazardous materials to support construction activities. All

TABLE 3.1-2
SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

Resource	No Action Alternative	Proposed Project
Prevention and Contaminated Sites	Hazardous materials are used and stored onsite at AGC and hazardous wastes are generated in support of airport management and aircraft operations and maintenance in accordance with federal and state hazardous material management protocols. The U.S. Steel Taylor Facility and STEP are adjacent to the AGC Runway 10 end. 7.8 acres of a closed hazardous waste landfill cell extend onto leased airport property. There is groundwater contamination at STEP and the surrounding area due to former U.S. Steel and historic coal mining activities. Solid waste and recycling collection is performed in accordance with the *Allegheny County Municipal Solid Waste Management Plan*.	construction activities will be performed in accordance with existing hazardous material and waste protocols, and no additional risk to human health or the environment is anticipated. Requires relocation of three STEP monitoring wells at the Runway 10 end and 1,000 feet of leachate pipeline at the Runway 28 end. There would be a temporary increase in solid waste generation in association with clearing 5.92 acres of forest land. Construction may require a groundwater management plan to manage contaminated groundwater.
Historic, Architectural, Archaeological, and Cultural Resources	Existing conditions would persist. A programmatic agreement identifies 280 acres of the 432-acre Airport property as a National Register-eligible Historic District, encompassing airport buildings, structures, and runways. Initial Airport development eliminated the potential for finding prehistoric archaeological resources over most of the property.	No effect.
Land Use	The existing RSAs would continue to be nonstandard and confer reduced safety benefits to land uses near the Runway 10-28 ends. Standard RSA dimensions at the Runway 28 end extend over part of Lebanon Church Road and adjacent commercial and institutional land uses. These land uses are incompatible within an RSA. All other existing land uses adjacent to AGC are considered compatible with an airport.	The Proposed Project is consistent with federal, state, and local, plans and objectives and resolves adjacent incompatible uses within existing RSA. As the EMAS compensates for the full RSA there would no longer be incompatible land uses within the RSA. The EMAS system would confer a positive impact to surrounding land uses by improving safety at the runway ends.
Natural Resources and Energy Supply	Existing conditions would persist. The demand for aircraft fuel, and to some extent water and energy, would continue to correlate with operations as forecasted for the Airport.	Approximately 557,709 cubic yards of clean fill material would be required. Demand for fill material is unlikely to overwhelm or restrict regional supply. The 30,986 dump truck loads (61,972 round-trips) required to import fill to the site may result in a relatively substantial amount of fuel consumption; however, this fuel demand would not exceed local fuel supplies. Water and energy consumption would temporarily increase over existing demand, but increase would not overwhelm existing or future supply.
Noise and Noise-Compatible Land Use	Existing conditions would persist. The surrounding industrial and commercial environment includes noise from airport, highways, and commercial and industrial uses.	The nearest sensitive receptors (residential communities 365 feet from Runway 28 end) and other noise sensitive uses are not likely to perceive temporary and intermittent construction noise estimated at 45 dB at their location.

TABLE 3.1-2
SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

Resource	No Action Alternative	Proposed Project
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks	Existing condition would persist. Airport operation would continue to provide positive effects to local economy. No ongoing adverse effects to environmental justice communities or risks to children's environmental health and safety.	Beneficial effect on the local economy, including the creation of temporary construction jobs and tax revenue. The 30,986 dump truck trips would increase local peak hour traffic by 0.3 to 1.1 percent; however, the additional truck trips would be temporary and are not anticipated to degrade level of service on surrounding roads. Impacts to environmental justice communities and additional exposure or unmitigated risks to children's environmental health and safety are not anticipated.
Visual Effects	Existing conditions would persist. The Airport is generally not visible to surrounding land uses, but is otherwise aesthetically consistent with existing industrial development in the viewshed. Most land uses in this area generate light emissions.	No permanent impact on the visual character and scenic quality of the area. No persistent light nuisance anticipated.
Water Resources (Wetlands, Surface Water, Floodplains, Public Water Supply, and Groundwater)	Existing condition would persist. The Airport is not in a floodplain. The river reaches connected to airport surface water are impaired by various contaminants. AGC operates in accordance with existing NPDES stormwater permits. There is potentially contaminated groundwater in the Study Area. No mapped Critical Aquifer Recharge Areas are within the airport vicinity.	No jurisdictional wetlands occur in the Proposed Project footprint. All channels in the Proposed Project footprint are constructed, AGC stormwater conveyance infrastructure and recommended as Other Surface Waters, which are not subject to permitting requirements. Fill depth may locally alter flow rate and depth to groundwater. No affect to public water supply.
Cumulative Impacts	Existing condition would persist. Ongoing private development/ redevelopment of land for residential, commercial, and industrial uses off airport property is expected to continue to infill available land. Although Comprehensive Land Use Plans guide efficient and appropriate development decisions, establishment of new activities and land uses in the region may: • increase or redistribute vehicle traffic • contribute to emissions of criteria pollutants and GHGs • increase ambient noise • improve socioeconomic conditions • adversely affect water quality/quantity and other aquatic resources • convert or fragment available wildlife habitat	Negligible incremental impacts to environmental receptors affected by other actions at AGC and within the greater landscape, including air quality, climate, wildlife, land use, noise, socioeconomics, surface transportation, natural resources, surface water, and hazardous materials and hazardous waste. As the cumulative projects are limited in scope, generally produce impacts that are temporary in duration, and would include implementation of best management practices, the incremental impacts to affected resources from these projects when combined with the effects of the Proposed Project are not anticipated to result in cumulatively significant impacts to any affected resource.

NOTES: CO = carbon monoxide; CO_2e = CO_2 equivalent; Db = Decibel; GHG = greenhouse gas; NAAQS = National Ambient Air Quality Standards; NO_X = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; STEP = South Taylor Environmental Park; SO_X = sulfur oxides; VOC = volatile organic compound; WHMP = Wildlife Hazard Management Plan

3.2 Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

3.2.1 Regulatory Context

The Clean Air Act of 1970 (42 U.S.C. §§ 7401-7671q), provides the basis for regulating air quality in the U.S. Under the Clean Air Act, the U.S. Environmental Protection Agency (USEPA) was charged with developing National Ambient Air Quality Standards (NAAQS) for six common air pollutants (known as criteria pollutants) considered harmful to public health and the environment. These pollutants include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter less than or equal to 10 microns in diameter (coarse particulates or PM_{10}), particulate matter less than or equal to 2.5 microns in diameter (fine particulates or $PM_{2.5}$), and lead. Areas in which concentrations of criteria pollutants do not exceed the NAAQS are designated as being in "attainment," and those areas where pollutant concentrations exceed the NAAQS are designated as being in "nonattainment." States are required to prepare State Implementation Plans demonstrating how and when pollutant concentrations will be reduced below the NAAQS. Under the General Conformity Rule (see 40 CFR part 93), certain federal actions occurring in nonattainment areas require a general conformity determination as defined under 40 CFR §93.153(b). The FAA has identified some types of projects that are "presumed to conform" (see 72 Federal Register 41565-41580 [July 30, 2007]), and are thus not subject to conformity requirements.

The Pennsylvania DEP works to protect Pennsylvania's air, land and water and works with the public to prevent pollution within the state. The Bureau of Air Quality within the DEP manages air quality monitoring for much of the state, develops State Implementation Plans, issue permits for the operation of emissions sources, and verifies pollution emissions from industrial sources. For Allegheny County, the local air quality is monitored by the Allegheny County Health Department.

3.2.2 Resource Study Area and Methodology

This analysis provides a quantitative estimate of projected emissions from construction activities only, as once completed there are no operational emissions associated with the Proposed Project. As AGC is within a nonattainment area for multiple criteria pollutants, an evaluation must be done in order to determine if the Proposed Project will increase the frequency or severity of these exceedances of the NAAQS. The Proposed Project does not fit within the projects identified in the FAA's list of "Presumed to Conform" actions. Accordingly, the General Conformity Rule is applicable and the overall emissions from the Proposed Project must be compared to the applicable *de minimis* levels for each relevant criteria pollutant. For purposes of this analysis, the project emissions were calculated and compared against the applicable *de minimis* levels. If the projected total emissions exceed the *de minimis* levels, further analysis in the form of a General Conformity determination must be completed. If the projected emissions do not exceed the *de minimis* levels, the General Conformity rule does not apply and no further analysis is required to confirm that the

Proposed Project will not increase the frequency or severity of the applicable criteria pollutant concentrations.

Construction emissions associated with the Proposed Project were calculated using the Airport Construction Emissions Inventory Tool (ACEIT),[33] which contains construction emission factors from existing USEPA regulatory models, such as the Motor Vehicle Emissions Simulator (MOVES, revised January 2013) and NONROAD (July 2009), as well as emission factors for fugitive emissions. To calculate a construction emissions inventory, the user specifies certain high-level inputs (such as project site location, weather, and cost), and ACEIT uses a series of assumptions to generate lists of emissions sources (such as construction equipment and employee on-road automobiles) and associated usage factors. ACEIT default activity levels were used for the AGC construction inventory estimates where information was otherwise not available. For example, the project description included precise amounts of fill for the Runway 10 RSA and Runway 28 RSA, so these values were used instead of the default levels given by ACEIT. In order to provide the most conservative estimate of potential emissions, the analysis assumed that construction and related emissions would occur in one calendar year. The project list, modeling parameters, and complete construction modeling assumptions can be found in **Appendix B.**

3.2.3 Existing Conditions

Table 3.2-1 lists the criteria pollutants, NAAQS attainment status, and *de minimis* thresholds applicable to Proposed Project study area. Allegheny County is designated as being in nonattainment for three criteria pollutants: ozone, sulfur dioxide, and $PM_{2.5}$ (2012 standard). The Pittsburgh-Beaver Valley area, which includes the entirety of Allegheny County and AGC, is designated as being in marginal nonattainment for the 8-Hour Ozone (2008) standard. Allegheny County is also part of the Ozone Transport Region that includes Pennsylvania and a number of neighboring northeastern states. Among other things, the Ozone Transport Region designation requires member states to install a certain level of controls for the pollutants that form ozone (ozone precursors), even if they meet the ozone standards. Parts of Allegheny County, including the Borough of West Mifflin and AGC, are designated as being in nonattainment for sulfur dioxide. Allegheny County is designated as being in moderate nonattainment for the most recent $PM_{2.5}$ standard (2012). There are areas of Allegheny County that are currently designated as being in maintenance for both carbon monoxide and $PM_{10,}$ but the Borough of West Mifflin is found to be in attainment for both of these pollutants. The Borough of West Mifflin is not classified as being in maintenance for any of the remaining criteria pollutants. The Pennsylvania DEP maintains State Implementation Plans for each of the criteria nonattainment pollutants in line with the applicable USEPA regulations.[34]

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[33] This tool was released with the 2016 TRB ACRP, *Guidance for Estimating Airport Construction Emissions*. ACRP Report 102. Available at: https://doi.org/10.17226/22437.

[34] Pennsylvania DEP, 2021. *State Implementation Plans.* Accessed in October, 2021 at: https://www.dep.pa.gov/Business/Air/BAQ/Regulations/Pages/Implementation.aspx

TABLE 3.2-1
ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN STUDY AREA

Criteria Pollutants	NAAQS Attainment Status	Associated *De Minimis* Threshold (if applicable)
Carbon Monoxide	Attainment	N/A
Lead	Attainment	N/A
Nitrogen Oxides	Attainment	N/A
Ozone (8 Hour, 2008)	Marginal Nonattainment	100 short tons of NO_X/ 50 short tons of VOC
Particulate Matter (PM_{10})	Attainment	N/A
Particulate Matter ($PM_{2.5}$)	Nonattainment	100 short tons
Sulfur Dioxide	Nonattainment	100 short tons

NOTES: N/A = Not Applicable; VOC = Volatile Organic Compound

Source: USEPA, 2021. *Green Book National Area and County-Level Multi-Pollutant Information.* Accessed in November, 2021 at: https://www3.epa.gov/airquality/greenbook/anayo_pa.html

The airport is located southwest of Pittsburgh with the Monongahela River to the north and east of AGC. Despite the hilly terrain, there are no meteorological or topographic features that would interfere with the dispersal of local air pollutant emissions. The Allegheny County Health Department maintains six air quality monitoring stations within Allegheny County covering the three nonattainment pollutants. The closest station to AGC is located approximately 3.75 miles to the southeast at South Allegheny High School in Liberty Borough and monitors sulfur dioxide and $PM_{2.5}$. The closest monitor for ozone is located 5.75 miles to the northwest at the Allegheny County Health Department office in Pittsburg. The Allegheny County Air Quality Annual Report states that there were no days where the 8-hour ozone standard was exceeded at any of the County's monitoring stations.[35] The Air Quality Annual Report stated that the Liberty Borough monitor was found to not exceed the annual sulfur dioxide standard but did exceed the hourly standard five times in 2019. The Report also stated that the Liberty Borough monitor exceeded the annual $PM_{2.5}$ standard and exceeded the 24-hour standard nine times in 2019.

Existing emission sources at AGC are typical of airports, including aircraft engines, ground service equipment, and auxiliary power units. As this analysis focuses only on the temporary increase in emissions from construction activities, a quantitative baseline air quality inventory for AGC was not prepared.

3.2.4 Environmental Consequences

3.2.4.1 Proposed Project

Construction associated with the Proposed Project is scheduled to begin in 2023 and may result in the production of mobile source emissions, primarily nitrogen oxides (NO_x), from the use of heavy-duty non-road construction equipment, such as graders, backhoes, and dozers, as well as on-road vehicles, such as dump trucks delivering the fill and cars used in employee travel to and from construction sites. In addition, fugitive dust emissions would result from site preparation and grading activities. Construction emissions can vary substantially from day to day depending on the

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[35] Allegheny County Health Department. 2019. *Air Quality Annual Report for 2019 with 1999 – 2019 Trends*.

phase of construction, the specific type of construction activities performed on a given day, and weather conditions.

Estimated construction-related criteria pollutant emissions associated with the Proposed Project are shown in **Table 3.2-2**.

TABLE 3.2-2
ESTIMATED EMISSIONS FROM CONSTRUCTION ELEMENTS

Project Element	Emissions (short tons/year)					
	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Runway 10 RSA	17.42	2.28	16.00	0.12	0.70	0.40
Runway 28 RSA	11.76	0.99	12.24	0.10	0.53	0.24
Midrunway RSA	7.50	0.69	7.86	0.06	0.26	0.15
Access Road Removal	1.20	0.05	0.07	0.00	0.06	0.01
Access Road Addition	1.07	0.07	0.07	0.00	0.03	0.01
NAVAIDS	1.89	0.08	0.13	0.00	0.01	0.01
Shed Relocation	0.09	0.02	0.06	0.00	0.06	0.00
Proposed Project Maximum Annual Emissions	40.93	4.17	36.42	0.29	1.64	0.81
***De Minimis* Thresholds**	none	50	100	100	none	100
***De Minimis* Threshold Exceeded**	NA	No	No	No	NA	No

NOTES: CO = carbon monoxide; N/A = Not Applicable; NO_X = nitrogen oxides; PM10 = particulate matter less than or equal to 10 microns in diameter; PM2.5 = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compound
Values may not total due to rounding

SOURCE: ACEIT, 2021; Environmental Science Associates, 2021.

The Proposed Project emissions are all lower than the *de* minimis levels applicable to the Airport geographic area; therefore, a General Conformity Determination is not required.

3.2.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Project would not be built. As a result, there would be no additional emissions generated at the Airport. Accordingly, the No Action Alternative would not cause or contribute to an exceedance of the NAAQS.

3.2.5 Significance Determination and Best Management Practices

Air quality effects determinations are based on changes in emissions of regulated pollutants under a proposed project when compared to a no action alternative for the same time frame, and impacts are reviewed for significance in light of federal air pollution standards and regulations. FAA Order 1050.1F states that significant air quality impacts would be demonstrated if the Proposed Action exceeded one or more of the NAAQS for any of the time periods analyzed or increased the frequency or severity of any such existing violations.

The construction emissions associated with the Proposed Project and the No Action Alternative would not cause or contribute to violations of the NAAQS for criteria pollutants throughout project construction or implementation even when considering the nonattainment and maintenance status of Allegheny County. Thus, the Proposed Project would not cause significant impacts to air quality in accordance with FAA Order 1050.1F.

Although the Proposed Project would not have significant air quality impacts and mitigation is not required, the airport and its construction contractors may choose to employ additional voluntary measures to further reduce emissions from construction activities and fugitive dust by considering some or all of the following practices:

- Curtailing construction activities during periods of high wind conditions.
- Reducing exposed erodible surface area through appropriate materials and equipment staging procedures; stabilizing stock-piles of raw materials and other temporarily disturbed areas with water or ground cover.
- Stabilizing soils and establishing persistent ground cover as soon as possible after grading and construction activities.
- Reducing equipment idling times and onsite vehicle speeds.
- Utilizing vapor-recovery systems for fuel-storage facilities.
- Using low- or zero-emissions equipment.
- Using covered haul trucks during materials transportation.
- Minimize the transportation distance between the fill origin location and the Proposed Project study area, and ensure all vehicles used for the project are fuel-efficient and meet emissions standards.

3.3 Biological Resources

Biological resources include terrestrial and aquatic plant and animal species; special status species, such as those protected under the federal *Endangered Species Act* or the State of Pennsylvania; and environmentally sensitive or critical habitats. Habitat is defined as the area or environment where the resources and conditions are present that cause or allow a plant or animal to live there. This analysis focuses on the biological resources observed or suspected to be present within or in the vicinity of the Proposed Project.

3.3.1 Regulatory Context

The Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544) requires the FAA to determine if a Proposed Project under its purview would affect a federally listed species or critical habitat designated for that species.[36] In addition, candidate species (any species that either the U.S. Fish and Wildlife Service [USFWS] is considering for listing as "endangered" or "threatened"), shall be identified. Although Pennsylvania's rare species of concern do not have the same regulatory protection as federal endangered or threatened species, state status is defined by the Pennsylvania

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[36] *Endangered Species Act*. 16 U.S. Code § 1531-1544. December 28, 1973. As amended 1976-1982, 1984, and 1988.

Department of Conservation and Natural Resources (DCNR) (plants),[37] Pennsylvania Game Commission (mammals and birds),[38] and Pennsylvania Fish and Boat Commission (fish, reptiles, amphibians, and aquatic invertebrates.[39] These agencies recommend or require applicable protective measures on a case-by-case basis.

The *Migratory Bird Treaty Act of 1918* (16 U.S.C. § 703 *et seq.*) is protective of many of the bird species with the potential to use the Proposed Project area. Specific to Pennsylvania, all non-game birds and their habitat are protected.[40] Although the Bald Eagle is no longer listed as threatened or endangered, this species is still protected by the *Bald and Golden Eagle Protection Act of 1940* (16 U.S.C. § 668 *et seq*.), the *Migratory Bird Treaty Act* (16 U.S.C. § 703 *et seq*.), and Pennsylvania nongame species regulations.

3.3.2 Resource Study Area and Methodology

A thorough review of publicly available resources, prior studies, and known site conditions was conducted to characterize biological resources within the Proposed Project study area and to provide a comprehensive listing of the potential for species occurrence, including any special status species. Database searches included:

- US Geological Survey, Multi-Resolution, Land Characteristics Consortium, National Land Cover Database
- US Department of Agriculture Natural Resource Conservation Service Web Soil Survey
- USFWS Information for Planning and Consultation database
- USFWS Environmental Conservation Online System
- USFWS Critical Habitat Mapper
- Pennsylvania Natural Heritage Program Conservation Planning and Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review
- Pennsylvania Spatial Data Access
- Southwestern Pennsylvania Commission Allegheny County Land Use/Land Cover

A team of environmental scientists conducted onsite field surveys in June 2021, to characterize the environmental and natural resources within the Proposed Project study area, including approximately 36 acres at the Runway 10 end and 48 acres at the Runway 28 end and mid-Runway location (see grey shaded area on **Figure 1-4**). These surveys included pedestrian surveys,

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[37] Plants: Pennsylvania Department of Conservation and Natural Resources, 1988. Title 17 Chapter 45, *Conservation of Native Wild Plants*, January 1;

[38] Mammals and Birds: Pennsylvania Game Commission, 1990. Title 34 Chapter 133, *Game and Wildlife Code*, revised Dec. 1.

[39] Fish, Reptiles, Amphibians, and Aquatic Invertebrates: Pennsylvania Fish and Boat Commission, 1991. Title 30, Chapter 75, *Fish and Boat Code*, revised February 9.

[40] Game birds, by Pennsylvania definition, include geese, brant, wild ducks, mergansers, swans, coots, gallinules, rails, snipe, woodcock, turkeys, grouse, pheasants, Hungarian partridges, bobwhite quail, and mourning doves. (Pennsylvania Game Commission, 1990. *Mammals and Birds: Title 34 Chapter 133, Game and Wildlife Code*, revised Dec. 1, 1990).

vegetative community identification, habitat assessments/evaluations, and a preliminary listed species review.

3.3.3 Existing Conditions

3.3.3.1 Habitat

Generally, most area within the study area is already disturbed and degraded and provides negligible habitat value in the regional landscape. The study area at the Runway 28 end is largely mowed grass surrounding airport access roads or concrete and paved ground that used to be a mobile home park. The study area at the site of the mid-Runway 28 fill location includes the fringe of a small, isolated wooded area bounded by railroad and industrial development to the north and abutting grassed and active airport area to the south. The study area at the Runway 10 end is a low-quality, unmaintained wooded hillslope remnant with a dense understory of bushy, non-native vegetation. This area has been impacted by the industrial and airport land uses directly to the east, landfill and historic coal mine to the west, and highway and commercial hub to the south. It is bisected by the existing airport and STEP landfill service roads with further evidence of extensive off-road vehicle recreation as quite a few unofficial trails meander throughout.

The wooded area off the Runway 10 end is the southern edge of a larger forested area that runs to the north-northeast. This area includes the U.S. Steel Taylor Facility, a restricted-access 490-acre property under remediation for past mining and waste disposal practices. The forested area of the Taylor Facility north of the STEP landfill is largely unmanaged and functions as wildlife habitat, including a wetland mitigation area to the east of airport property and adjacent to the Proposed Project study area. An approximately 3-mile long, largely forested natural area identified in the Allegheny County Land Use Plan as a greenspace corridor runs to the north-northeast beginning immediately north of the Taylor Facility.[41] This habitat is predominantly classified as an oak-hickory forest, including white and red oaks, tulip trees, red maple, hickories, and a dense, shrubby understory. This corridor is bounded by Highway 885 (Lebanon Road) to the east and Streets Run (a tributary of the Monongahela River) and Baldwin Road to the west and terminates just prior to the highway interchange, bridge, and riverfront development at the Monongahela River. A Pennsylvania Natural Heritage Program core habitat natural resource area, Liberty Valley, is four miles south of the Proposed Project area.

As the AGC campus and surrounding area is urbanized/industrial, much of the land cover (and habitat type) is defined by human-dominated land uses, and natural habitat or vegetation communities are generally absent. **Figure 3.3-1** illustrates the existing land cover classifications within the Proposed Project study area and adjacent greater landscape. These classifications are described as follows:[42]

- *Agricultural:* includes the use of growing and harvesting of crops and livestock. These are areas such as pastures, farms, and ranches. There is a negligible amount of agricultural land available in the greater landscape adjacent to the airport and none in proximity to the study area.

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[41] Allegheny County, 2008. *Allegheny Places: The Allegheny County Comprehensive Plan*. December.

[42] Human-dominated land use categories correspond with land use parcel data available from Pennsylvania Spatial Data Access (PASDA), accessed in July 2021 at: https://www.pasda.psu.edu/. Southwestern Pennsylvania Commission, 2015. *Allegheny County Land Use/Land Cover 2010.*

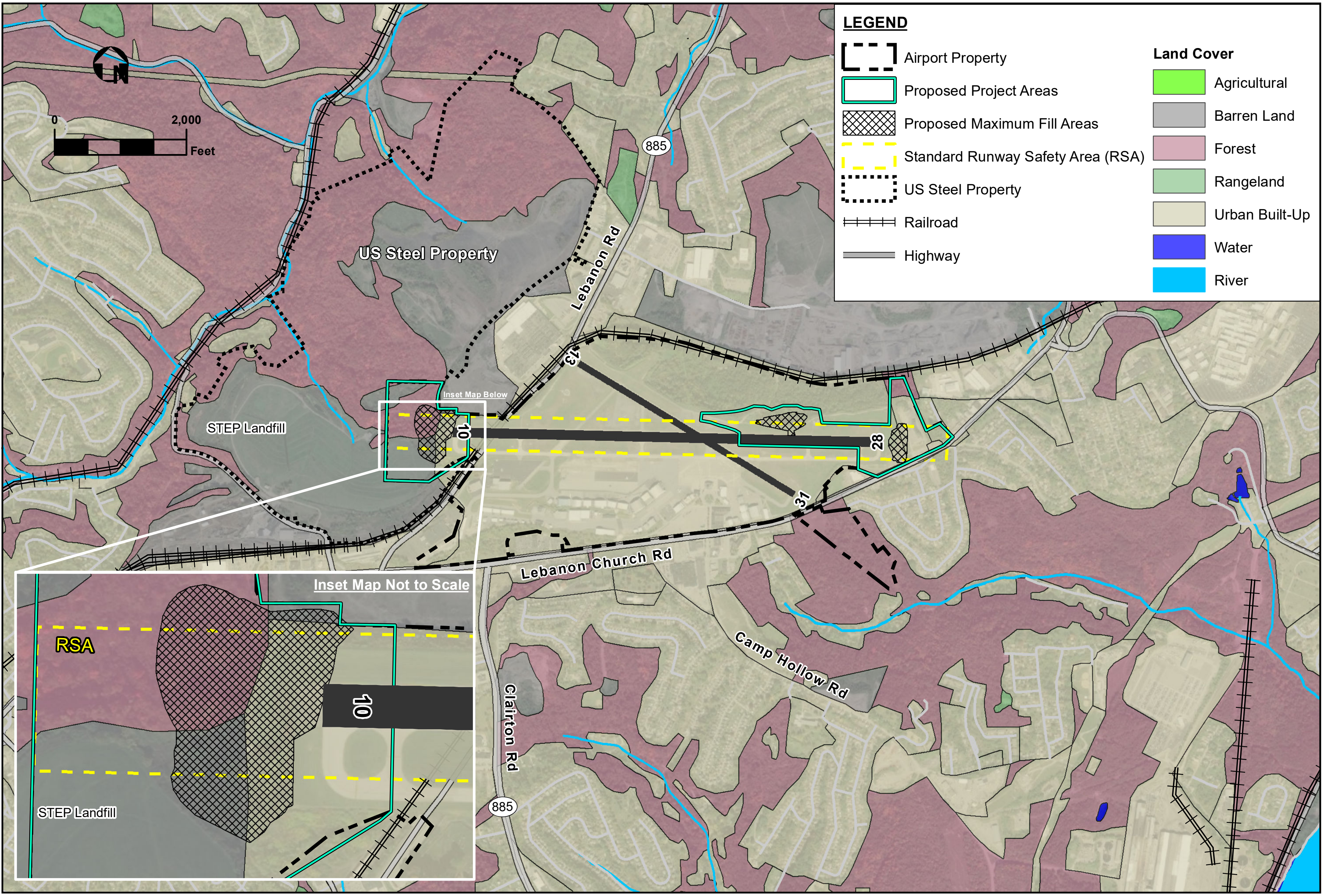
- *Barren Land*: is of limited ability to support life and in which less than one-third of the area has vegetation or another cover. In general, it is an area of thin soil, sand, or rocks. This category is present within the study area and adjacent to the proposed fill area at the Runway 10 end and includes the U.S. Steel Taylor Facility and STEP landfill site.

- *Forest:* is generally undeveloped land covering a minimum area of 1 acre upon which the primary vegetative species are trees, including land that formerly had such tree cover and that will be regenerated, and tree plantations. Tree-covered areas in intensive agricultural crop production settings, such as fruit orchards, or tree-covered areas in urban settings, such as city parks, are not considered forestland. The forested portions of the Proposed Project area are mostly dominated by healthy mature canopy trees, such as maples, oaks, and cherries. The underbrush of these forested areas is typical of disturbed land and contains dense patches of noxious invasive species, such as blackberry bushes, multiflora rose, and Japanese honeysuckle. Forest is present within the project area at the Runway 10 end and within the Airport/ urban build-up area at the mid-Runway 28 fill area. It also occurs in the U.S. Steel Taylor Facility natural area (north of the STEP landfill and slag pit to the Monongahela River).

- *Rangeland:* is comprised of areas where the potential natural vegetation is predominantly grasses, grass-like plants, forbs, or shrubs and where natural herbivory was an important influence in its precivilization state. There is a negligible amount of rangeland within the study area and none in proximity to the Proposed Project area.

- *Urban Build–Up:* is comprised of areas of intensive use with much of the land covered by structures. Included in this category are cities, towns, villages, commercial developments along highways, transportation, power, communication complexes, and institutions that may, in some instances, be isolated from urban areas. The majority of the Proposed Project area and AGC campus is categorized as urban build-up.

- *Water:* all land areas that are persistently covered in water, including streams, canals, lakes, reservoirs, bays, and estuaries. The AGC campus does not contain any land that is consistently covered in water, but ephemeral, intermittent, and perennial streams; wetlands; and manmade stormwater features are located within the study area. Water (including river) systems are further discussed in Section 3.12 *Water Resources*.



Date: 12/9/2021
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Source: Esri; Pennsylvania Spatial Data Acccess (PASDA), accessed July 2021 at https://www.pasda.psu.edu/;
Southwestern Pennsylvania Commission, 2015, Land Use/Land Cover 2010; Adapted by ESA, 2021.

FIGURE 3.3-1
LAND COVER

3.3.3.2 Common Wildlife

Characteristic wildlife that would be expected in the vicinity of AGC includes typical forest-dwelling creatures such as mammals (white-tailed deer, groundhogs, grey squirrels), multiple bird species (finches, cardinals, robins, red-wing black bird, and wild turkeys) and reptiles and amphibians (Eastern box turtle, Eastern American toad, Northern dusky salamander, spotted salamander, red spotted newt, and the Eastern garter snake). AGC property includes limited quality habitat and is fully surrounded by chain link fence to exclude larger wildlife species off of airport property, and as such, minimal common wildlife species (wild turkeys, small bird species, and one Eastern box turtle) were observed during field assessments.

3.3.3.3 Special Status Species

A PNDI environmental review performed by the Pennsylvania DCNR, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, and the USFWS concluded that that no known occurrences of species or resources under DCNR's jurisdiction, such as plants, terrestrial invertebrates, natural communities, and geologic features, are recorded in the vicinity of the Proposed Project (**Appendix C**).[43] This area is not part of a designated Natural Heritage Area, Important Bird Area, or other designated critical habitat or significant ecosystem.

Based on observations of available habitat, the federally listed or protected and state listed special status species with potential to occur in the Proposed Project area are listed in **Table 3.3-1**,[44] and a comprehensive list of special status species in the County, including migratory birds that may utilize adjacent forests, is available in **Appendix C**. While there are no known occurrences of threatened and endangered fish and wildlife species within the study area,[45] the Indiana bat (*Myotis sodalis*) and Northern long-eared bat (*Myotis septentrionalis*) are listed as Federal Species of Concern by the Pennsylvania Natural Heritage Program, and favorable habitat may occur within and adjacent to the study area. Pennsylvania Natural Diversity Inventory mapping indicates that these bats have potential habitat throughout Allegheny County, including the Proposed Project areas. Suitable potential bat habitat includes forests containing trees greater than 5 inches in diameter, including species with exfoliating bark, nitrogen-fixing species, and other species such as sugar maple *(Acer saccharum*), hickory (*Carya* sp.), oak (*Quercus sp.*), sassafras (*Sassafras albidum*), slippery elm (*Ulmus rubra*), and wild black cherry (*Prunus serotina*).[46] In general, any tree removal to be done should be conducted during winter months to ensure that any potential bat nesting trees are undisturbed.

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[43] PDCNR, 2021. AGC Runway Improvements. *PNDI Environmental Review* Receipt Number 734056.

[44] USFWS, 2021. *Information for Planning and Consultation (IPaC)*. Accessed in April, 2021, at: https://ecos.fws.gov/ipac/.

[45] Pennsylvania Natural Heritage Program: http://www.naturalheritage.state.pa.us/inventories.aspx.

[46] USFWS, 2009. *Range-wide Indiana Bat Protection and Enhancement Plan Guidelines*.

TABLE 3.3-1
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN STUDY AREA

Species	Common Name	Status	Jurisdiction	Potential Occurrence within the Study Area/Proposed Project Area[1]
Myotis sodalist	Indiana Bat	Endangered	USFWS	Low possibility for this species to occur within the study area. Minimal habitat may exist, including sugar maple, hickory, oak, elm, sassafras, and/or black cherry, as well as standing dead trees or snags.
Myotis septentrionalis	Northern Long – eared Bat	Threatened	USFWS	Low possibility for this species to occur within the study area. Minimal habitat may exist, including sugar maple, hickory, oak, elm, sassafras, and/or black cherry, as well as standing dead trees or snags.

(1): The PNDI review has concluded that the Proposed Project is not likely to impact any special status species.

SOURCES:

- USFWS Information for Planning and Consultation database, accessed March 2021 at https://ecos.fws.gov/ipac/
- NatureServe Explorer, accessed in April 2021 at https://explorer.natureserve.org/
- Pennsylvania DCNR 2021. AGC Runway Improvements. *PNDI Environmental Review* Receipt Number 734056
- Pennsylvania Natural Heritage Program Conservation Explorer: http://www.naturalheritage.state.pa.us/species.aspx

NOTE: Species were evaluated for their potential to occur within the study area and, therefore, their potential to be impacted by the Proposed Project footprint. Potential to occur was based on a combination of baseline biological surveys and historical information. Potential to occur within the Proposed Project area may also be influenced by occurrences in adjacent similar habitat, and this potential has been noted as appropriate.

3.3.4 Environmental Consequences

Potential impacts to biological resources from construction and ongoing maintenance activities include direct impacts of habitat loss as natural areas are permanently converted to airport use.

3.3.4.1 Habitat

Proposed Project

The Proposed Project anticipates direct impacts from clearing, grading, and compacting the maximum fill area only, with no to negligible temporary impacts anticipated outside of this area (**Table 3.3-2**). Approximately 5.92 acres of forested habitat, none of which is considered high-quality vegetative land cover, would be impacted by the Proposed Project.

TABLE 3.3-2
HABITAT TYPE AND AREA IMPACTED BY THE PROPOSED PROJECT

	Total Direct Impacts (acres within maximum fill area)	**Forest** (acres)	**Barren Land** (acres)	**Urban Build Up** (acres)
Runway 10 End	9.20	3.59	2.14	3.48
Runway 28 End	3.06	0.00	0.0	3.06
Mid-Runway 28	3.42	2.33	0.0	1.09
TOTAL	15.68	5.92	2.14	7.63

The slopes will be revegetated with a weed-free seed mix designed specifically to avoid attracting wildlife per ACAA and FAA requirements. The slopes will receive minimal routine maintenance, and trees that revegetate this area naturally may need to be removed or maintained at a height that does not create vertical obstructions to aircraft. Without regular mowing or herbicide treatment, it is likely that invasive weed species may recolonize the area over time. This situation would increase edge habitat in proximity to the managed wetland and forest in the U.S. Steel Taylor Facility natural area, which may act as a source for weed species if such establish on unmaintained slopes.

The Proposed Project will contribute incrementally, coupled with other development pressure in the region, to the general decrease of natural area in the greater landscape and reduction of the forested corridor north of the Runway 10 end.

No Action Alternative

Under the No Action Alternative, no additional site disturbance would occur. The No Action Alternative would not affect existing, already disturbed and degraded habitats, and these areas would continue to provide negligible habitat value in the regional landscape.

3.3.4.2 Wildlife

Proposed Project

Although most of the construction activity would occur in portions of the Airport that have been disturbed and graded in the past and are subject to ongoing human presence and noise disturbance from airport, road, and other adjacent industrial activities, the loss of 5.92 acres of forested cover would likely impact some resident and transient wildlife species within the Proposed Project areas. Once clearing begins, most mobile wildlife species would be expected to avoid or leave the project area and migrate as possible to the adjacent forest habitat associated with the U.S. Steel Taylor Facility and further north. It is not likely that larger mammal species would recolonize the harvested forest areas as trees would not be reestablished on slopes supporting the new RSA. The slopes would be designed and maintained specifically to avoid attractiveness to insects, rodents, and other food species for birds and other wildlife. Limited resident species diversity is a preferable situation for the Airport to minimize wildlife safety hazards and discourage wildlife attractant ecosystems from establishing.[47]

The Pennsylvania DCNR PNDI Environmental Review concluded that the Proposed Project is not expected to impact special status species, and that no further coordination is required for this project.[48] The PNDI review is valid for two years, after which the Proposed Project and any changes would need to be resubmitted for supplemental review and potential update. It is anticipated that the Proposed Project would have No Effect on the Indiana and Northern long-eared bats; however, as a conservative measure, ACAA would consider clearing trees located within the Proposed Project footprint only from November 15 to March 31 to occur outside of bat nesting season.[49] This

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[47] As it is not a Part 139 airport, AGC is not required to and has not developed an airport-specific Wildlife Hazard Management Plan (WHMP); however, ACAA aligns wildlife and landscape management techniques outlined in the *Pittsburg International Airport WHMP* (ACAA 2016).

[48] PDCNR 2021. *AGC Runway Improvements. PNDI Environmental Review* Receipt Number 734056.

[49] U.S. Fish and Wildlife Service, 2021. *Guidance on Developing and Implementing an Indiana Bat Conservation Plan*. May 20. For project areas affecting Indiana bat swarming habitat (near hibernacula) only cut trees between Nov 15 and March 31. For project areas affecting Indiana bat summer habitat, only cut trees between October 1 and March 31.

time restriction would also minimize any impact or disturbance to migratory birds utilizing adjacent forest habitats.

Localized habitat loss or degradation, continued noise interference, or direct physical impacts to species can have a cumulative impact when viewed on a regional scale. Although abundant alternate habitat currently exists outside of the Proposed Project area, incremental land use conversions across the region cumulatively have the long-term effect of shrinking viable wildlife populations.

No Action Alternative

Under the No Action Alternative, there would be no additional affects to species occupying the marginal habitat available within the Proposed Project area.

3.3.5 Significance Determination and Best Management Practices

FAA Order 1050.1F identifies that factors to consider in a significance determination for biological resources include whether or not the action would have the potential for a long-term or permanent loss of unlisted plant or wildlife species; adverse impacts to special status species or their habitats; substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels required for population maintenance.

Given the type and frequency of habitat available in the Project Area, the Proposed Project would not significantly impact terrestrial and aquatic plant and animal species, game and non-game species, special status species, or environmentally sensitive or critical habitats. There are no species of concern known or anticipated to occur within the Proposed Project area, and the Proposed Project would likely not cause substantial loss, reduction, degradation, disturbance to the native species in the area.

Although the Proposed Project would not have significant impacts to biological resources and mitigation is not required, the airport and its construction contractors may choose to employ additional voluntary measures that would be protective of onsite and adjacent ecosystems, such as the following considerations:[50]

- Use a conservative approach to project design that minimizes permanent and temporary disturbances to soil and native vegetation. This will conserve habitat and limit opportunities for invasive plants.
- Limit tree clearing activities to occur outside of the breeding seasons of bats and migratory birds.
- Install water quality best management practices during and after construction to minimize erosion and sedimentation in waterways. Use clean project materials (e.g., weed-free straw) or

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[50] PDCNR 2021. *AGC Runway Improvements. PNDI Environmental Review Receipt Number 734056.*

materials native to the worksite to avoid introducing invasive species from contaminated sources.

- Use native plants for revegetation and stormwater management.
- Avoid blanket herbicide applications; instead, spot-treat undesirable tall woody vegetation and invasive weeds. Where mowing is necessary and in accordance with the Wildlife Hazard Management Plan, reduce frequency to once every few years during the dormant season (i.e., after first frost in late fall and before bird nesting in early spring), leaving some refugia for overwintering wildlife.
- Monitor for invasive plants before, during, and after project activities and promptly control any identified infestations. Frequent monitoring allows for early detection and rapid response.

3.4 Climate

Increasing concentrations of greenhouse gases (GHGs) in the atmosphere are affecting global climate, and there is a direct correlation between fuel combustion and GHG emissions.[51] GHGs include carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Long-term climate data collection and models indicate Earth's climate is changing, with associated impacts including warmer air temperatures, increased sea level rise, intensified storm activity, and alteration of seasonal precipitation events.

The analysis of climate includes both the potential emission of additional GHGs incrementally contributing to climate change, but also includes an assessment of the project's resiliency to the potential effects of climate change. Resiliency is defined as "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions."[52] Airports Council International members adopted the Resolution on Resilience and Adaptation to Climate Change, advancing the determination that responsible airport sponsors should analyze potential vulnerabilities to infrastructure and operations and avoid or mitigate potential threats to existing assets and future developments.[53] These considerations may help reduce the impact of climate-related threats, which otherwise would result in loss of revenue or require increased expenditure to retrofit airport assets to a new environment.

3.4.1 Regulatory Context

Executive Order (EO) 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (2021), establishes direction for federal agencies for improving climate preparedness and resilience strategies. EO 14057 *Catalyzing America's Clean Energy Economy*

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[51] International Panel on Climate Change (IPCC), accessed in September 2021 at: https://www.ipcc.ch/.

[52] International Panel on Climate Change (IPCC), 2012, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change, Glossary of Terms* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA.

[53] Airports Council International (ACI), 2018. ACI Policy Brief: *Airports' Resilience and Adaptation to a Changing Climate,* September and *ACI Resolution* March, 2018.

Through Federal Sustainability (2021) provides specific goals and management practices to be implemented by federal agencies. The CEQ provides guidance on the consideration of GHG in NEPA documents.[54] While there is currently no formal planning process established, federal entities generally consider adaptation to the effects of climate change in accordance with local, state, and federal planning initiatives.

The *Pennsylvania Climate Change Act of 2008* (Act 70) requires the Pennsylvania DEP to maintain an inventory of GHG emissions across the state and assess climate impacts and develop an action plan every three years. The *Climate Impacts Assessment* (2021)[55] includes analysis of climate conditions and prediction of future climate scenarios. The *Pennsylvania Climate Action Plan* (2021)[56] includes strategies to reduce GHG emissions, establishes statewide reduction goals of 26 percent by 2025 and 80 percent by 2050 (over 2005 levels), and it offers 18 specific adaptation strategies as climate change continues to impact the state. The Pennsylvania DEP voluntary Local Climate Action Program has 53 local governments across Pennsylvania in membership, all of which have focused on, and reduced, their GHG footprint.

3.4.2 Methodology

GHG analysis was performed in conjunction with the air quality analysis discussed in Section 3.2. Construction emissions associated with the Proposed Project were calculated using ACEIT[57] and methodologies prescribed in the FAA's Aviation Emissions and Air Quality Handbook.[58] Only the temporary emissions from construction activities are analyzed as there are no ongoing actions once the project is in place, and all construction was assumed to occur in the year 2023 in order to provide the most conservative emissions estimate. Construction of EMAS blocks is not included in the emissions estimate, but is anticipated to have a relatively small impact on GHG emissions. Reference Section 3.2.2. and **Appendix B** for additional details regarding methodology and model inputs (including the project list, modeling parameters, and complete construction modeling assumptions).

GHG emissions from construction equipment and vehicles are converted to metric tons of CO_2-equivalent (CO_2e) by using a standard factor that accounts for the differences in 100-year global warming potential for each GHG. Global warming potential represents the amount of heat captured by a mass of GHG compared to a similar mass of CO_2. For example, 1 kilogram (kg) of methane is approximately equivalent to 25 kg of CO_2, and nitrous oxide is approximately 298 times more potent a GHG than CO_2.

Climate resiliency, including measures considered in planning the Proposed Project that would protect facilities and infrastructure constructed as part of the Proposed Project, is analyzed

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[54] CEQ 2016. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*. – Under Review.

[55] Pennsylvania Department of Environmental Protection, 2021. *Pennsylvania Climate Impacts Assessment.*

[56] Pennsylvania Department of Environmental Protection, 2021. *Pennsylvania Climate Action Plan*.

[57] This tool was released with the 2016 TRB ACRP, *Guidance for Estimating Airport Construction Emissions*. ACRP Report 102. Available at: https://doi.org/10.17226/22437.

[58] FAA, Office of Environment and Energy, 2015. *Aviation Emissions and Air Quality Handbook*, Version 3/Update 1. January.

qualitatively against local planning initiatives and considers the four elements generally associated with climate change predictions: increased temperatures, climate (precipitation) shift, increased incidence of extreme storm events, and sea level rise. This analysis considers the potential impacts specific to protecting and maintaining airport infrastructure associated with the Proposed Project in light of anticipated climate changes for this region as given in the Pennsylvania DEP *Climate Impacts Assessment* (2021).[59]

3.4.3 Existing Conditions

The Pennsylvania DEP is planning for an increase in summer and winter temperature, increase in occurrence and volume and altered seasonality of rain events, and increased incidence and severity of major storms. The general implications of these climate changes specific to airports are detailed in **Appendix D**. Pennsylvania DEP has measured a 2-degree Fahrenheit temperature increase since 1900, and has identified the following science-based climate predictions for the region by 2050.[60]

- A 5.9-degree Fahrenheit average temperature increase.
- An average of five to eight weeks over 90 degrees every year (compared to 5 days per year in 1971–2000).
- 95 degrees or hotter 10 days every year (compared to less than one day in 1971-2000).
- Episodes of drought interspersed with extreme rainfall events, leading to an average 8 percent increase in rain and causing statewide inland flooding events.
- A 2.1-foot sea level rise and more tidal flooding in the Delaware Estuary coastal zone.
- Significant fluctuations in Lake Erie's water levels and temperatures, as well as coastal erosion.

The ACAA is committed to GHG reduction and climate change adaptation. Currently ACAA oversees the PIT microgrid, which powers both terminals, the airfield, the Hyatt hotel, and a gas station, and is fueled by the airport’s onsite natural gas wells and 8-acre, 8,000 solar panel field. The ACAA serves on the Allegheny County Green Action Team, supporting sustainability initiatives across the Pittsburgh region, has planted honeybee apiaries throughout the airport, and instituted a successful recycling program.

3.4.4 Environmental Consequences

Climate effects determinations are based on changes in GHG emissions relative to existing conditions and participation in local, regional, national, and global programs.

3.4.4.1 Proposed Project

Construction activities are anticipated to contribute 40,431 short tons of CO_2e. It is understood that, while the incremental consequence of additional GHG emissions associated with activities at AGC and the airport’s participation in climate-related programs may be trivial, the airport does have an incremental additive role in the cumulative success of reducing its contribution to, and thus the

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[59] Pennsylvania Department of Environmental Protection, 2021. *Pennsylvania Climate Impacts Assessment.*

[60] Predictions reproduced from: Pennsylvania Department of Environmental Protection, 2021. *Pennsylvania Climate Impacts Assessment.*

impacts of, climate change (**Table 3.4-1**). A detailed discussion of how GHG emissions were modeled for the Proposed Project is included in **Appendix B**.

TABLE 3.4-1
ANNUAL GHG EMISSIONS (SHORT TONS OF CO_2e)

Proposed Project (2023-2026)[1]	US Aviation Sector (2019)	United States (2019)	Global (2019)[2]
40,431	196,211,413	7,228,957,577	33,000,000,000 - 55,000,000,000

NOTES:

[1] The total GHG emissions for the Proposed Project are based on the results of the air quality construction emissions analysis discussed in Section 3.2, *Air Quality*. The calculated emissions represent the estimated emissions for the period of Proposed Project construction. In addition to criteria pollutants, the ACEIT model estimates emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). While CO_2 makes up the majority of greenhouse gases emitted globally, CH_4 and N_2O constitute the second and third largest amounts of greenhouse gas emissions worldwide. Together, these three gases make up 98 percent of global emissions and 97 percent of national emissions (USEPA. Greenhouse Gas Emissions, https://www.epa.gov/ghgemissions.). The total emissions for CH_4 and N_2O were converted to CO_2e and combined with total CO_2 emissions to produce total short tons of CO_2e reported in this table.

[2] There is no definitive source of current information totaling carbon emissions on a global scale; thus, a range is given based on a wide search of various known credible agencies. Estimating global GHG emissions is a multifaceted task including emissions over multiple industries and both developed and undeveloped regions of the world as emissions change and shift constantly in each of these areas.

SOURCES: EPA 2021. Inventory of US Greenhouse Gas Emissions and Sinks, 1990 – 2019, US Department of Energy, Office of Science, 2014. Carbon Dioxide Information Analysis Center, accessed November 2021 at: https://cdiac.ess-dive.lbl.gov/trends/emis/meth_reg.html#

It is not anticipated that the Proposed Project will experience or exacerbate additional impacts from the anticipated effects of climate change. The EMAS system is fortified to withstand a variety of climates, and as such is specifically designed to tolerate prolonged high temperatures and manage precipitation events, including snow and rainstorms, without disproportionate facility weathering. Furthermore, the 2:1 and 1.5:1 slopes and accompanying engineered stormwater management system that will be established beyond the EMAS bed would be less vulnerable to excessive rain or increased erosion than the existing condition where, in some places, the slopes are 23 percent grade with no stormwater management system in place.

3.4.4.2 No Action Alternative

Under the No Action Alternative, no additional GHG would be produced at AGC as no construction would occur. The ACAA would continue to implement energy-saving strategies throughout its operations to help reduce and offset GHG emissions across the region.

3.4.5 Significance Determination and Best Management Practices

There are no federal standards established for aviation-related GHG emissions. Likewise, the FAA has not identified any significance thresholds for aviation-related GHG emissions, nor has it identified specific factors to consider in making a significance determination for GHG emissions.

It is not anticipated that GHG emissions associated with the Proposed Project would be significant. GHG emissions are expected to increase temporarily in relation to construction. Although the contribution of GHG emissions at AGC is negligible on a global scale, ACAA will adhere to all state and local plans to reduce GHG emissions from its facilities, equipment, and procedures, and conform with FAA, state, and local climate change resiliency planning initiatives. The Proposed Project will consider best industry practices to further reduce the AGC/ACAA GHG emission footprint as the Proposed Project is designed and implemented.

Because there would be no significant GHG emissions or climate-related impacts associated with the Proposed Project, any measures undertaken by the Airport would be voluntary and are not required by the FAA. However, ACAA would consider strategies and best industry practices to reduce CO_2 emissions, increase efficiency, optimize performance, eliminate unnecessary use of resources, and protect the environment.

3.5 Hazardous Materials and Waste, Solid Waste, Pollution Prevention, and Contaminated Sites

Hazardous materials and wastes are chemical substances that pose a substantial hazard to human health or the environment. Solid waste is any garbage, refuse, sludge, or other discarded material resulting from industrial, commercial, institutional, and residential activity. Pollution prevention is a “multi-media” program that is intended to reduce or eliminate the effect that an operation or activity may have on the total environment. Contaminated sites are known locations where hazardous materials and waste or other solid waste are present.

3.5.1 Regulatory Context

Federal, state, and local laws have been established to govern the transport, use, storage, disposal and cleanup of hazardous materials and waste, including the *Comprehensive Environmental Response, Compensation, and Liability Act* (42 U.S.C. §§ 9601-9675); the *Emergency Planning and Community Right to Know Act* (42 U.S.C. §§ 11001-11050); the *Oil Pollution Act* (33 U.S.C. §§ 2701-2762); the *Resource Conservation and Recovery Act* (RCRA) (42 U.S.C. §§ 6901-6992k); and the *Toxic Substances Control Act* (15 U.S.C. §§ 2601-2697). Other state regulations and agency guidance include the Commonwealth of Pennsylvania *Hazardous Sites Cleanup Act* (Public Law 756, No. 108) and FAA Advisory Circular 150/5320-15A, *Management of Airport Industrial Wastes*.

Solid waste is primarily controlled through RCRA. Pollution prevention is established as a national objective in the *Pollution Prevention Act of 1990* (42 U.S.C. §§ 13101-13109). This legislation requires pollution be addressed at the source, whenever possible, through waste reduction and prevention. In addition to reduction of waste at the source, use of non-hazardous substances, affirmative procurement, recycling, and conversion to energy are all methods of curtailing solid and hazardous wastes.

3.5.2 Resource Study Area and Methodology

Environmental analyses of hazardous materials and solid wastes focus on evaluating the activities that utilize hazardous materials or produce hazardous or solid waste as a byproduct and identifying locations where hazardous materials (including environmental contamination) might occur.

The following databases were reviewed to determine the presence of hazardous or solid waste sites in the Proposed Project study area:

- USEPA My Environment Mapper[61]
- Pennsylvania DEP Open Data and Reports[62]
- RCRA Corrective Action Reports for Contaminated Groundwater and Human Exposures on the adjacent U.S. Steel Taylor Facility property[63]

A Preliminary Geotechnical Survey associated with the Proposed Project was performed by a team of geologists in February 2021, which included an initial evaluation of groundwater chemistry in the study area (**Appendix E**).[64] A total of nine borings were drilled to characterize the subsurface conditions within the study area, and geotechnical and environmental laboratory tests were performed to provide anticipated geologic and groundwater conditions and the potential effects on construction.

3.5.3 Existing Conditions

There are previously contaminated areas adjacent to the Proposed Project area. The Pittsburgh Coal Seam, which was extensively mined until the early 20th Century, underlies most of the AGC property, study area, and neighboring land uses. The abandoned mines are located 250 feet beneath the ground surface and have caused acid mine drainage at multiple off-airport locations. Additionally, U.S. Steel Corporation has owned the 490-acre Taylor Facility property to the west and north of AGC since the early 1900s and has used it for disposal of iron- and steelmaking byproducts. The U.S. Steel Taylor Facility was previously designated as a Comprehensive Environmental Response, Compensation, and Liability Act Superfund site but was delisted in 1983 and is no longer on the National Priorities List of Superfund sites. Within the 490-acre Taylor Facility, and adjacent to the AGC Runway 10 end, is the 240-acre U.S. Steel STEP. The STEP includes a landfill area comprised of three distinct cells: the hazardous and old residual waste landfill cells are permanently closed, and the residual waste landfill cell is closed/inactive.[65] The hazardous waste landfill encompasses a subsurface expanse of 10.7 acres, of which 7.8 acres extend onto AGC property (**Figure 3.5-1**). This area is under a lease agreement with ACAA.

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[61] US EPA MyMap Interactive Tool, accessed in July, 2021 at: https://geopub.epa.gov/myem/envmap/myenv.html?minx=-79.97593999999994&miny=40.29963000000008&maxx=-79.87393999999993&maxy=40.40163000000008&ve=11,40.350584,-79.924940&pText=West%20Mifflin,%20Pennsylvania&pTheme=home.

[62] Pennsylvania DEP, accessed in July 2021 at: https://www.dep.pa.gov/DataandTools/Reports/Pages/default.aspx and https://newdata-padep-1.opendata.arcgis.com/.
Reports include: Pennsylvania DEP, Bureau of Environmental Cleanup and Brownfields. *Regulated Storage Tank Cleanup Incidents. West Mifflin Borough*. Downloaded July 14th 2021.
Pennsylvania DEP, Bureau of Environmental Cleanup and Brownfields. *Hazardous Sites Cleanup Act (HSCA) Activities. West Mifflin Borough.* Downloaded July 13th 2021.
Pennsylvania DEP, *Land Recycling Program. Sites in Progress. West Mifflin Borough.* Downloaded July 13th 2021.

[63] USEPA 2017. *Documentation of Environmental Indicator Determination, RCRA Corrective Action, Environmental Indicator RCRIS code (CA725) Current Human Exposures Under Control and Groundwater Under Control.*

[64] ACAA, 2021. *Preliminary Geotechnical Exploration Report for the Runway 28 Safety Area Improvement Project AGC, Pennsylvania.*

[65] U.S. Steel Corporation, 2020. *Draft Phase IIC Project Summary Report, Groundwater Monitoring Network Evaluation Hazardous and Residual Waste Landfills, South Taylor Environmental Park, West Mifflin, Pennsylvania.* November.

A leachate pipeline originates at the STEP wastewater treatment plant and terminates 5 miles to the southeast at the Irvine Works wastewater treatment plant (**Figure 3.5-1**). This pipeline is used to collect and transfer contaminated groundwater from the hazardous waste landfill to an offsite treatment facility. Additionally, U.S. Steel operates several groundwater monitoring wells adjacent to the airport. The Preliminary Geotechnical Survey performed in conjunction with this Proposed Project noted contamination in various groundwater samples, including 14 elevated metal parameters detected at concentrations above their respective laboratory reporting limits; of these, four parameters (cobalt, lead, manganese and vanadium) were detected in one or more groundwater samples at concentrations above their respective non-residential Pennsylvania DEP medium-specific concentrations (**Appendix E**).

AGC hazardous substances are handled in accordance with all applicable federal and state regulations. Hazardous materials are used and stored onsite at AGC, and hazardous wastes are generated in support of airport management and aircraft operation and maintenance. Such substances include petroleum, oils, and lubricants and other materials used for aircraft and ground vehicle maintenance. AGC operates a fuel farm near the southern terminus of Taxiway E, comprised of five 20,000-gallon Jet A fuel tanks, one 20,000-gallon 100LL fuel tank, one 12,000-gallon 100LL fuel tank, and one 10,000-gallon Jet A fuel tank (**Figure 3.5-1**). Deicing services are provided by the Voyager Jet Center Fixed Base Operator north of the fuel farm. Potassium acetate is stored in a 5,000-gallon tank for use in airfield deicing. Three underground storage tanks are also associated with the Voyager Jet Center Fixed Base Operator facilities, one with a capacity of 12,000 gallons and two with 20,000-gallon capacities.

There are no existing contaminated areas within AGC airport property. Only two documented hazardous materials incidents have occurred at AGC, both of which did not occur near the Proposed Project areas and have been previously cleaned up and closed.

Solid waste and recycling collection at AGC is provided by Waste Management through a contract with the ACAA. Solid waste and recycling collection is performed in accordance with the Allegheny County Municipal Solid Waste Management Plan.[66]

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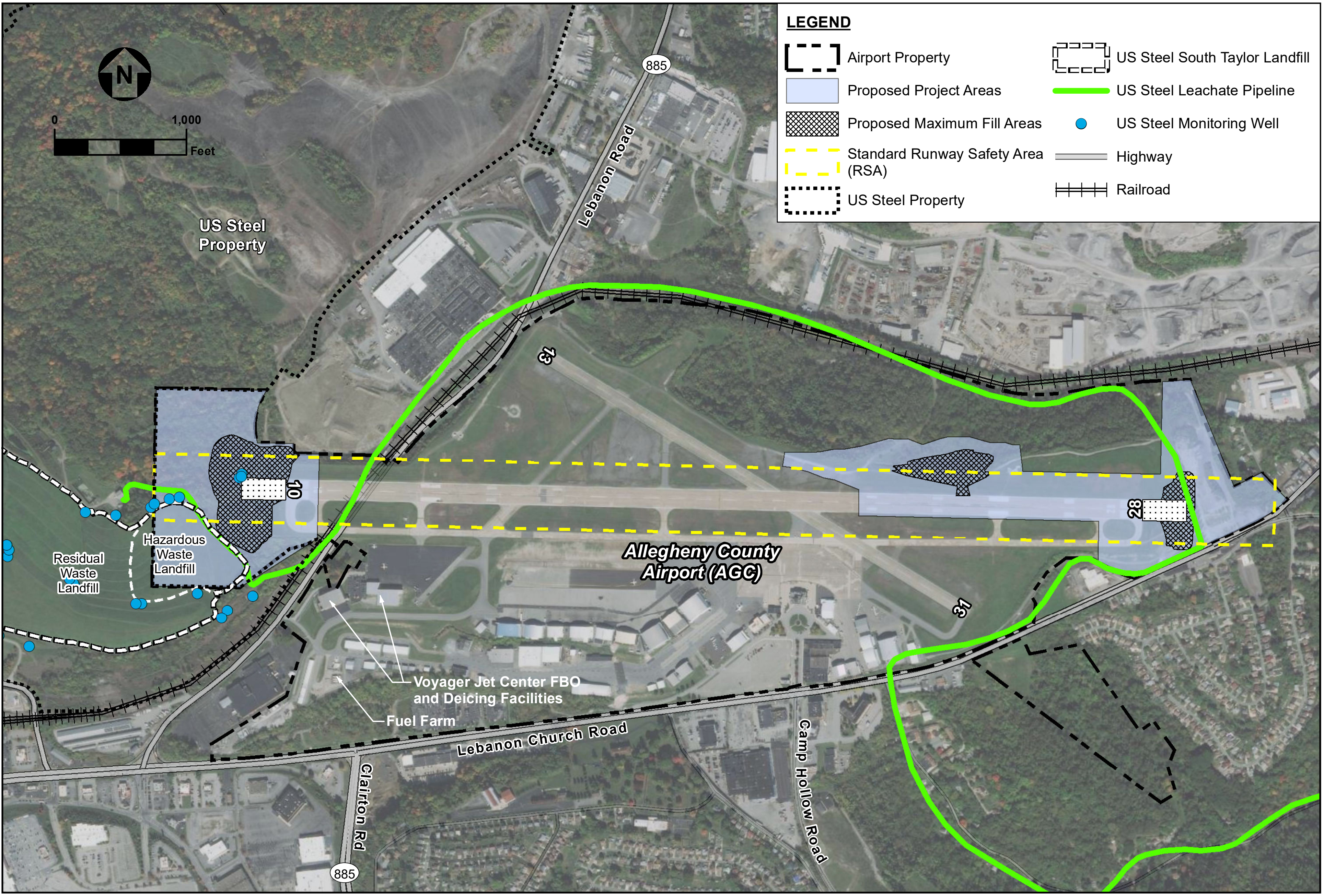
[66] Allegheny County Health Department, 2018. *2019 Municipal Solid Waste Management Plan*. September.



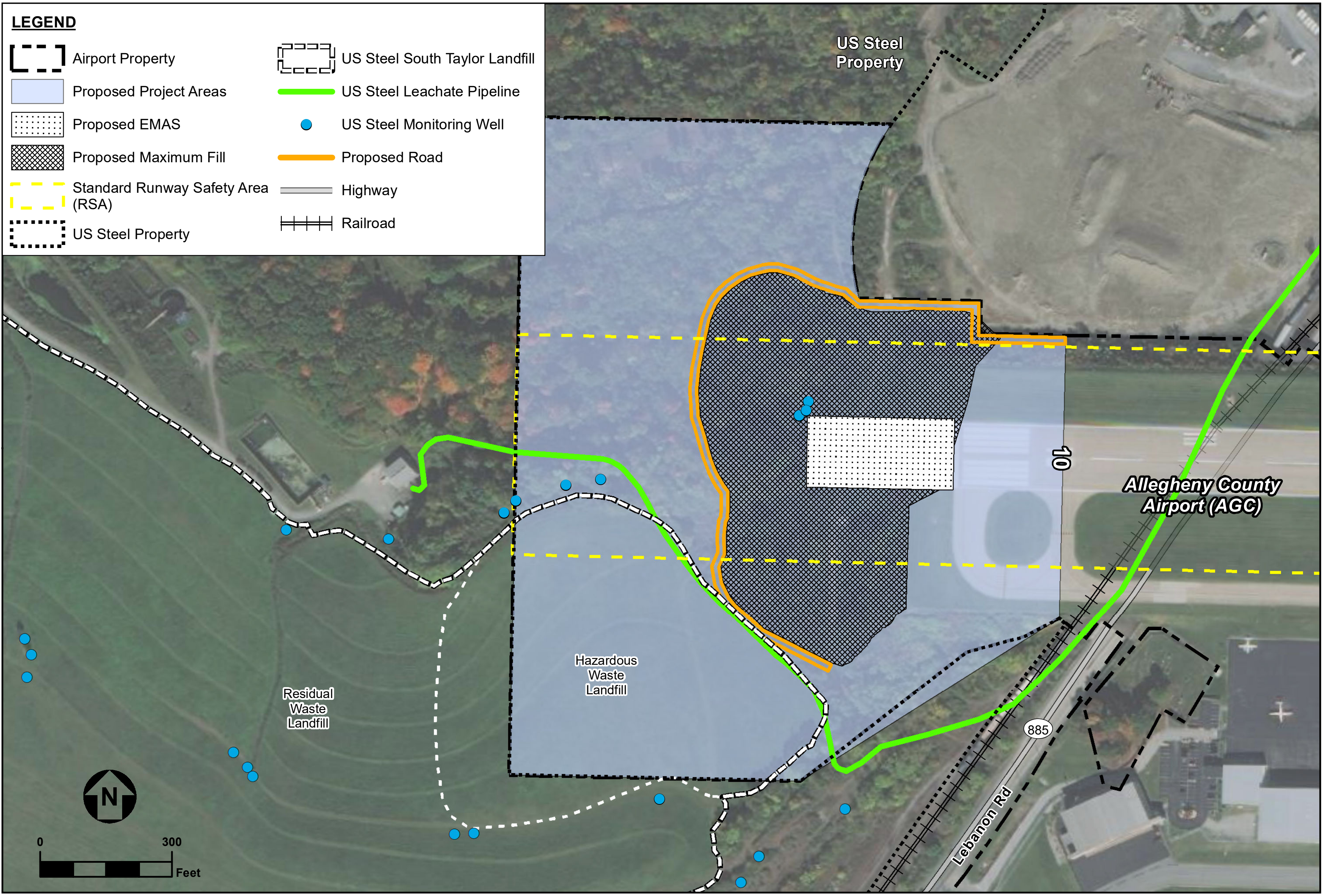
Date: 11/22/2021
U:\GIS\GIS\Projects\19xxxx\D201901425_EA for AGC Runway 10-28 RSA\03_MXDs_Projects\Novemeber 2021 EA Maps\Fig3.5-1_Proposed Project Study Areas_w_HMHW.mxd

Source: Esri; GAI; Adapted by ESA, 2021.

AGC RSA EA

FIGURE 3.5-1a

HAZARDOUS MATERIALS AND CONTAMINATED SITES



Source: Esri; Michael Baker International, 2020/2021; Adapted by ESA, 2021.

AGC RSA EA

FIGURE 3.5-1b

HAZARDOUS MATERIALS AND CONTAMINATED SITES - RUNWAY END 10 CLOSE-UP

3.5.4 Environmental Consequences

The magnitude of potential impacts associated with hazardous substances depends on their toxicity, transportation, storage, and disposal. Factors included in the analysis were the potential for substantial increases in the human health risk or environmental exposure through storage, use, transportation, or disposal of hazardous materials, hazardous waste, or toxic substances. An increase in the quantity or toxicity of hazardous materials and/or hazardous waste handled by a facility may also result in a potentially adverse effect, especially if the facility is not equipped to handle a new waste stream.

For contaminated sites, factors considered included the potential for disturbance of a contaminated site, potential changes in remediation status of existing sites, or addition of new sites. A threshold for contaminated site impacts would be exceeded if the Proposed Project were not compatible with existing land use controls or caused interference with existing remediation activities; had the potential to cause migration of contamination; or exposed human receptors, including construction workers or site employees, to unmitigated health risks associated with potential direct contact with contaminants.

3.5.4.1 Proposed Project

The grading and fill required for the Proposed Project would deliberately avoid encroaching upon the boundary of the U.S. Steel STEP Hazardous Waste Landfill at the Runway 10 end, as a result, no impacts to the landfill or land use controls would occur. A 1,000-foot segment of the U.S. Steel leachate pipeline crosses the Proposed Project area at the Runway 28 end, and three monitoring wells associated with clean-up activities at the landfill site at the Runway 10 end are within the Proposed Project construction footprint. Both the pipeline and the monitoring wells would require relocation outside of the maximum fill area. Discussions between U.S. Steel and Pennsylvania DEP regarding the relocation of these amenities are ongoing concurrent with the NEPA process, and any regulations or requirements that emerge from these discussions will be implemented by ACAA and the construction contractor.[67] No existing hazardous material or waste handling facilities on AGC are within the Proposed Project area or would be impacted by construction activities.

In accordance with municipal and residual waste regulations,[68] the construction contractor will ensure that only clean fill would be transported to the project site and that all off-site waste and borrow areas have an Environmental and Sampling Plan approved by the local conservation district or Pennsylvania DEP. Clean fill is defined as "uncontaminated, non-water soluble, non-decomposable, inert, solid material used to level an area or bring an area to grade."[69] The construction contractor will submit a Standard Clean Fill note as required for General NPDES Permit approval application.[70] Surface water runoff from the new RSA slopes would be subject to stormwater management, including monitoring and treatment of hazardous contaminants with

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[67] Personal communication between Matthew Sickles, GAI and Eric Williams, U.S. Steel on November 2, 2021, regarding *Follow up to 11/2/21 Call – Coordination with U.S. Steel for ACAA AGC RSA EA Project*.

[68] 25 Pennsylvania Code § 271.101(b)(3) and § 287.101(b)(6).

[69] Pennsylvania DEP, Bureau of Waste Management, 2021. *Management of Fill Policy*, Document 258-2182-773.

[70] Pennsylvania Certification of Clean Fill electronic submission form, accessed in September 2021 at: https://www.dep.pa.gov/Business/Land/Waste/SolidWaste/Residual/Pages/default.aspx

stormwater management infrastructure to be expanded as appropriate to capture, convey, and treat the additional volume. Nonpoint source pollution is not anticipated to result from the Proposed Project.

Because lead, manganese, and vanadium were detected in groundwater at concentrations above the non-residential medium-specific concentrations, construction personnel would avoid direct contact with encountered groundwater. If groundwater is anticipated to be encountered during construction activities, a site-specific Health and Safety Plan would be developed to address potential exposure. In addition, if planned construction activities would require excavations or dewatering thereof, a Groundwater Management Plan would be developed, including procedures for the proper management, storage, sampling, transportation, infiltration, and/or disposal of potentially impacted groundwater. The Groundwater Management Plan would include procedures for discharging and infiltrating extracted water within the Proposed Project site boundary and procedures for required sampling and analysis if extracted groundwater is to be disposed offsite.

Construction activities associated with the Proposed Project would involve hazardous materials such as engine oil, lubricants, solvents, sealants, and paint. During construction activities, all hazardous materials used and all hazardous waste generated would be handled by the contractor in accordance with the contractor's management plan and other applicable federal, state, and local protocols. Hazardous materials storage and construction equipment maintenance would be conducted away from any surface water resources. The construction contractor will be responsible for pollution prevention, spill prevention, and response plans specifying the measures to be taken to prevent and, when necessary, clean up and minimize the environmental impact of any accidental releases of hazardous materials. The ongoing use of the RSA and EMAS post-construction would not involve additional use of hazardous materials or the generation of hazardous or solid waste

A temporary increase in solid waste generation at AGC would occur in association with clearing 5.92 acres of forest land within the Proposed Project footprint at the Runway 10 end and mid-Runway 28 area. An unknown volume of woody and vegetative landscape debris would be transported off-site by the construction contractor for composting in accordance with local procedures, and would not exceed the capacity of local composting facilities. The airport is committed to sustainable environmental stewardship and is dedicated to the ongoing pursuit of pollution prevention activities that may be relevant to this construction activity.

3.5.4.2 No Action Alternative

The No Action Alternative would not affect the ongoing management of hazardous substances and solid waste at AGC. All hazardous materials, contaminated sites, and solid waste would continue to be appropriately managed through existing infrastructure and protocols in accordance with federal, state, and local regulations.

3.5.5 Significance Determination and Best Management Practices

The FAA has not established a significance threshold for impacts associated with hazardous materials and waste, solid waste, pollution prevention, or contaminated sites. The Proposed Project would not use or generate significant volumes of hazardous materials or create new waste streams. Adherence to all federal, state, and local laws will be maintained during construction and operation, and any contaminated sites and associated infrastructure will be avoided during construction. Therefore, no significant environmental impacts are anticipated to result from the Proposed Project.

3.6 Historical, Architectural, Archeological, and Cultural Resources

Historic, architectural, archaeological, and cultural resources are expressions of human culture and history in the physical environment, and may include archaeological sites, buildings, structures, objects, districts, works of art, architecture, and natural features that were important in past human events. They may consist of physical remains, but also may include areas where significant human events occurred even though evidence of the events no longer persists. Historic, architectural, archaeological, and cultural resources also include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups

3.6.1 Regulatory Context

Section 106 of the *National Historic Preservation Act of 1966* (54 U.S.C. § 300101 *et seq*.) requires a federal agency with jurisdiction over a proposed federal action (referred to as an “undertaking”) to take into account the potential effects of the undertaking on historic properties. “Historic properties” refers to “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register [of Historic Places]” (36 CFR 800.16(*l*)(1)). The Section 106 process is accomplished through consultation with the State Historic Preservation Office (SHPO), Tribal Historic Preservation Offices designated by a federally-recognized American Indian tribes, local governments, and other interested parties. The goal of consultation is to identify potentially affected historic properties, assess effects to such properties, and seek ways to avoid, minimize, or mitigate any adverse effects on such properties. The *Environmental Rights Amendment* (Pa. Const. Art. 1, § 27) and the *Pennsylvania History Code* (37 Pa. Cons. Stat. § 500 *et seq*. (1988)) is the Pennsylvania legislation regarding cultural resources. Consultation with American Indian tribes regarding issues related to Section 106 must recognize the government-to-government relationship between the U.S. federal government and tribes as set forth in EO 13175, *Consultation and Coordination with Indian Tribal Governments* and the *Presidential Memorandum on Tribal Consultation* (2009).[71]

3.6.2 Resource Study Area and Methodology

An Area of Potential Effects (APE) is a specialized study area developed for the consideration of potential impacts to historic, historic architectural, and archaeological resources. The APE defines the areas within which an action and its alternatives could directly impact or indirectly cause changes in the character or use of historic properties and/or archaeological resources. The APE for this Proposed Project is congruent with the Proposed Project area. The Pennsylvania SHPO requires submittal of project information through their portal for consultation under Section 106 and the

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[71] Other crucial laws related to cultural resources not detailed here include the *Archaeological Resources Protection Act* (16 U.S.C. §§ 470aa - 470mm) and the *Native Graves Protection and Repatriation Act* (25 U.S.C. §§ 3001-3013).

Pennsylvania History Code, and consultation materials for the Proposed Project are available in **Appendix F**.[72]

3.6.3 Existing Conditions

A Programmatic Agreement made between ACAA, FAA, the SHPO, and interested Tribal Historic Preservation Offices in July 2008 (amended February 2021) identifies 280 acres of the 432-acre Airport property as a National Register-eligible Historic District, encompassing airport buildings, structures, and runways. The 2021 Programmatic Agreement Amendment states that improvement to the Runway 10-28 RSA can proceed without National Historic Preservation Act Section 106 consultation. The 2008 Programmatic Agreement also notes that, to develop the airport, most of AGC property was cut, filled, and graded. Hilltops were removed in excess of 20 to 30 feet and the peripheries of the property were filled in excess of 30 feet, essentially eliminating the potential for finding prehistoric archaeological resources over most of the property.

3.6.4 Environmental Consequences

3.6.4.1 Proposed Project

The Pennsylvania SHPO determined that the Proposed Project will have no effect on above ground or archaeological resources.[73] Outreach to American Indian tribes with interest in this region has been initiated and is ongoing during this NEPA process. As the intent is limited to the placement of fill on airport property, with the exception of the need to relocate existing utilities to outside of the fill area there is no excavation and minimal soil disturbance associated with the Proposed Undertaking; thus, it is not anticipated that undiscovered artifacts are at risk from further site clearing and grading activities. However, in the event an unanticipated discovery of previously unidentified archaeological resources is made during construction of the proposed undertaking, or if historic property concerns arise, construction activities in the vicinity of the discovery will stop, and all reasonable measures will be taken to avoid or minimize harm to the property until the FAA and ACAA conclude further consultation with Pennsylvania SHPO (**Appendix F)**.

3.6.4.2 No Action Alternative

Under the No Action Alternative, no site disturbance would occur; thus, no impacts to unknown cultural resources would be anticipated.

3.6.5 Significance Determination and Best Management Practices

In the significance determination for cultural resources, FAA Order 1050.1F considers whether or not the action would have the potential to result in a finding of Adverse Effect through the Section

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[72] Pennsylvania State Historic Office, Historical and Museum Commission, *Environmental Review PA-SHARE Submission Portal*, accessed in October 2021 at: https://www.phmc.pa.gov/Preservation/Environmental-Review/Pages/default.aspx

[73] Pennsylvania State Historic Preservation Office, Pennsylvania Historical and Museum Commission. October 5, 2021. Letter from Andrea MacDonald, Director SHPO to William Caramana, GIA Consultants Inc., regarding ER Project #2021PR06386.001, *Improvement of the Runway 10-28 Runway Safety Area, Federal Aviation Administration, West Mifflin Borough, Allegheny County.*

106 process. According to Section 106 of the National Historic Preservation Act, a proposed action has an effect on a historic property when the action may alter characteristics of the property that may qualify it for inclusion in the National Register of Historic Places (36 CFR, Part 800.9(a)). An effect would be considered adverse if it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include the physical destruction of all or part of the property, changes to aspects of the property's setting, or alteration of character-defining features (36 CFR, Part 800.9(b)).

The Proposed Project will have no effect on historic, architectural, archaeological, and cultural resources within the APE. Therefore, the Proposed Project is not expected to exceed any threshold indicating a significant impact.

3.7 Land Use

Land use refers to the way land is developed and employed. It is typically described in general categories of activity such as residential, commercial, industrial, institutional, open space, transportation/ utilities, or vacant/undeveloped. Land use planning in the vicinity of airports ensures that airport actions are compatible with current and future off-airport land uses and that both on and off airport activities can be conducted safely.

3.7.1 Regulatory Context

Section 1502.16(c) of the CEQ Regulations requires the discussion of environmental impacts including "possible conflicts between the proposed action and the objectives of federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned." Land use controls in the vicinity of AGC are established by the Borough of West Mifflin and are implemented through the zoning regulations of the West Mifflin Code, which defines the specific land uses permitted in each zoning district.

3.7.2 Resource Study Area and Methodology

The evaluation of the compatibility of the Proposed Project with surrounding land uses is focused on the Proposed Project and adjacent areas. Land use data is available from the Pennsylvania Spatial Data Access geospatial data access portal[74] and the Southwestern Pennsylvania Commission Global Information System Center.[75]

Per Section 9.3 of the *FAA Order 1050.1F Desk Reference*, conflicts may occur when a Proposed Project creates impacts that are incompatible with existing and/or future planned land uses. Factors considered in evaluating land use impacts include the potential for the Proposed Project to be incompatible with surrounding land uses; result in a change of land use that would degrade airport services or safety; or be inconsistent or in conflict with the environmental goals, objectives, or

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[74] Pennsylvania Spatial Data Access, accessed in July 2021 at: https://www.pasda.psu.edu/. Southwestern Pennsylvania Commission, 2015. Allegheny County Land Use/Land Cover 2010.

[75] Southwestern Pennsylvania Commission GIS Center, Accessed in July 2021 at: https://www.spcregion.org/resources-tools/gis-center/

guidelines of the Allegheny County Comprehensive Land Use Plan[76] or West Mifflin Borough Zoning ordinances.[77] To avoid duplication, land use compatibility planning related to Noise (Section 3.9), Socioeconomics (Section 3.10), lands protected under Section 4(f) of the DOT Act (Section 3.1.3), Visual Effects (Section 3.11), and the management of wildlife hazard attractant habitat (Section 3.3) are discussed in the corresponding sections of this EA.

3.7.3 Existing Conditions

AGC is located in an industrial/built up area of the Borough of West Mifflin. All land within the Proposed Project area is currently within the AGC property boundary and is used for transportation/airport services as designated **(Figure 3.7-1)**. At the Runway 10 end, the Proposed Project area boundary is surrounded by industrial, open space, and vacant land. This includes the U.S. Steel STEP landfill, a quarry site, and undeveloped land. At the Runway 28 end, the Proposed Project area is surrounded by commercial, institutional, residential, and industrial uses. These uses include retail activities (e.g., home renovation showrooms and automobile dealerships), a warehouse for building materials, a fire station, and single-family homes. The length of a standard RSA at the Runway 28 end extends over Lebanon Church Road and commercial and institutional land uses, which are incompatible land uses within an RSA.

The Proposed Project study area encompasses multiple zoning districts including (I-1) Restricted Industrial and (C-1) General Commercial districts. An (R-4) Mobile Home Park Residential district is designated beyond the Runway 28 end and refers to a former mobile home park site that has since been relocated.[78] An (R-2) Medium-Density Residential district is found adjacent to the Proposed Project area across Lebanon Church Road south of the Runway 28 end.

3.7.4 Environmental Consequences

3.7.4.1 Proposed Project

The Proposed Project would occur entirely on AGC property and would not result in changes to local land uses or conversion of adjacent land uses to airport use. The Proposed Project is consistent with local, state, and federal plans and objectives, and no uses have been identified within or outside of airport property that would be incompatible or otherwise degrade airport services or safety. The proposed EMAS system would improve safety infrastructure, thus conferring a positive impact to surrounding land uses by compensating for the full length of the RSA, especially at the Runway 28 end where incompatible land uses occur within the existing RSA.

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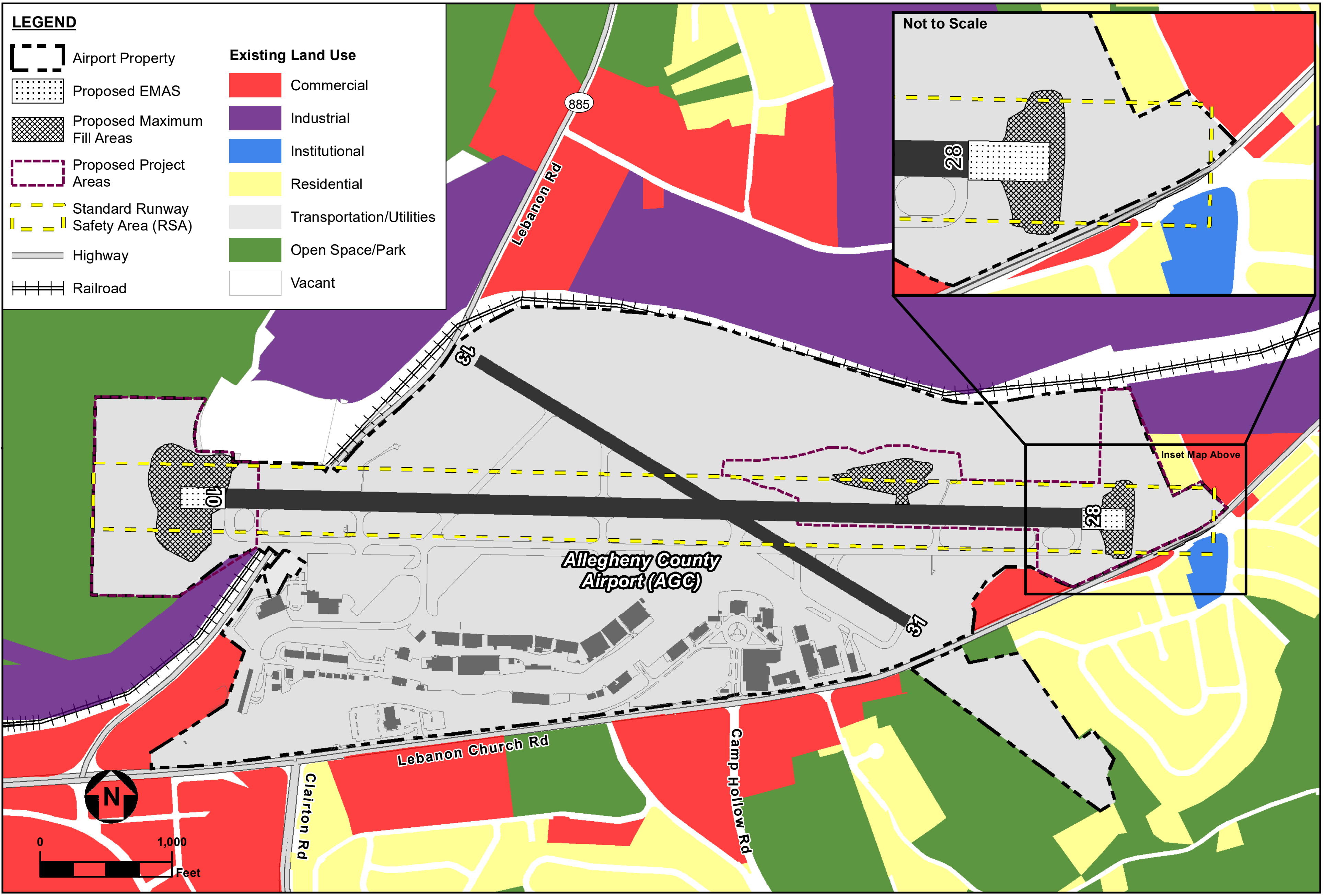
[76] Allegheny County Economic Development, Planning Division. 2008.*Allegheny Places: the Allegheny County Comprehensive Plan*. December,

[77] West Mifflin Borough, 2021. *Zoning Map*. Accessed in July 2021 at: https://westmifflinborough.com/zoning/

[78] ACAA, 2002. *Final Environmental Assessment for Allegheny County Airport Runway 28 Safety Area and Object Free Area Improvements,* January. Prepared by McFarland-Johnson, Inc.



Date: 11/22/2021
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Source: Esri; Pennsylvania Spatial Data Access, 2010; Southwestern Pennsylvania Commission, 2021; Western Pennsylvania Regional Data Center, 2021; Adapted by ESA, 2021

AGC RSA EA

FIGURE 3.7-1
LAND USE SURROUNDING AGC

3.7.4.2 No Action Alternative

Under the No Action Alternative, the length of a standard RSA at the Runway 28 end would continue to extend over Lebanon Church Road and commercial and institutional land uses incompatible with an RSA. Incompatible Residential land uses at the Runway 28 end were resolved in 2002 with the relocation of the Broscius Mobile Home Park. Under the No Action Alternative, surrounding land uses near the ends of Runway 10-28 would not benefit from any safety improvements to the existing nonstandard RSA, and airport operations would continue under the same level of operational safety (see Section 1.4). The proposed EMAS would not be constructed and the additional stopping assistance would not be available in the event of runway overruns.

3.7.5 Significance Determination and Best Management Practices

A significant land use impact would occur if the Proposed Project was not compatible with existing zoning or land use in the area. Whether or not a land use impact is significant typically depends on the significance of impacts related to other resource categories such as noise, health, safety, or environmental justice. These potential impacts are discussed in Sections 3.9 and 3.10, respectively.

It is anticipated that the Proposed Project will have a beneficial impact on land use as it improves airfield safety by mitigating the effects of potential runway end overruns that could negatively impact areas adjacent to AGC. The improvements would all occur on AGC property and would not result in discontinuation of any off-airport activities. No adverse impacts to land uses around the Proposed Project areas are anticipated.

3.8 Natural Resources and Energy Supply

3.8.1 Regulatory Context

Federal laws addressing natural resources and energy supply include the *Energy Independence and Security Act* of 2007 (42 U.S.C. § 17001 *et seq.*) and the *Energy Policy Act* of 1992 (42 U.S.C. § 15801 *et seq.*). These laws encourage agencies to take actions to move operations and infrastructure toward energy reliability and independence. The FAA requires the consideration of potential impacts to utilities (including electricity, water/sewage, and fuel), impacts to consumable or scarce materials, and compliance with state and local rules, ordinances, or guidelines. In keeping with the spirit of NEPA, the FAA encourages the development of facilities designed and constructed with sustainability and energy efficiency best practices (FAA Order 1053.1, *Energy and Water Management Program for FAA Buildings and Facilities*).

3.8.2 Resource Study Area and Methodology

The analysis discusses the demand for energy and natural resources generated by the Proposed Project, including changes in demand for these resources. Per FAA Order 1050.1F, Exhibit 4-1, the analysis should consider situations in which the Proposed Project or alternative(s) would have the potential to cause demand to exceed available or future supplies of these resources. The analysis also analyzes whether the Proposed Project, when compared to the No Action Alternative, would have the potential to exceed the local energy supply.

3.8.3 Existing Conditions

3.8.3.1 Natural Resources

The Airport and surrounding community are provided water service by the Pennsylvania American Water Company through their West Mifflin system. The West Mifflin system draws its water from the Monongahela River at an intake point approximately four miles north of the Airport. The Airport has no aquifer of its own and there are no reliable sources of groundwater on Airport property.

Construction of the Proposed Project would require approximately 442,468 cubic yards of fill material at the Runway 10 RSA, the Runway 28 RSA would require approximately 61,239 cubic yards of fill, and the mid-Runway 28 RSA would require approximately 54,002 cubic yards of fill.

3.8.3.2 Energy Supply and Utilities Services

Utility services are provided by several local companies. Electrical service is provided to more than 600,000 customers throughout Allegheny and Beaver Counties, including West Mifflin Borough, by Duquesne Light Company.[79] Gas service is provided to West Mifflin Borough by the Columbia Gas Company. The Columbia Gas Company provides gas service to approximately 4 million customers in 450 communities in 26 counties in western and southern Pennsylvania.[80] Sanitary sewage service is provided throughout AGC facilities by the West Mifflin Sanitary Sewer Municipal Authority. Municipal sewage lines convey sewage from Airport property to the Curry Hollow Pumping Station and on to the Thompson Run Sewage Treatment Plant.

3.8.4 Environmental Consequences

3.8.4.1 Proposed Project

The primary natural resources that would be utilized as part of the Proposed Project are water and fill material (clean dirt or rock). Water would be used during construction activities for purposes of reducing dust and cleaning equipment; however, once construction is complete, there would be no further increased demand for water resources associated with the Proposed Project. The temporary increase in demand for water associated with Proposed Project construction would not exceed local supplies.

The Proposed Project would require a total of approximately 557,709 cubic yards of clean fill material. The location of the borrow site(s) is undetermined at this time; however, there are several site options in proximity to (e.g., within 50 miles of) the Proposed Project area. It is not anticipated that the demand for fill material associated with this project would overwhelm the selected borrow pit operation(s) or restrict regional supply for other actions in the area.

Importing the fill material to the project site would require approximately 30,986 dump truck loads from the borrow site to the Proposed Project area (61,972 total trips there and back). Assuming that

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[79] Duquesne Light Company, *Duquesne Light Co. Fact Sheet* https://www.duquesnelight.com/docs/default-source/default-document-library/company-fact-sheet-2021-v36cf3cb0262c1670a862eff320080324a.pdf?sfvrsn=1432ac42_2, accessed November 2021.

[80] Columbia Gas of Pennsylvania https://www.columbiagaspa.com/our-company/about-us, accessed November 2021.

the borrow site is no greater than 50 miles from the Project Area, and dependent on the age and fuel efficiency of the vehicles, operator's driving habits, and traffic encountered, the number of trips may result in a substantial relative amount of fuel consumption. However, this fuel demand would not exceed local fuel supplies.

While there may be a temporary increase in the use of electricity and other utility services at AGC during construction, the increase in demand on these resources would be minimal and is not anticipated to exceed local supplies. Once completed, the use of these resources would revert to pre-construction levels. It is not anticipated that the Proposed Project would have any impact on sewer services.

3.8.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Project would not be built. As a result, there would be no additional demands made on natural resources or energy supply at the Airport.

3.8.5 Significance Determination and Best Management Practices

The Proposed Project is unlikely to result in more than a minimal relative increase in demand on natural resources or energy supply, and all natural resource demands would be associated with project construction and temporary in nature. Water, fill material, and the provision of utility services, such as gas and electricity, are all generally available in Western Pennsylvania, and the temporary minor increase in demand associated with the project construction would not exceed local supplies. Accordingly, no significant impacts to natural resources or energy supplies are anticipated.

3.9 Noise

3.9.1 Regulatory Context

FAA Order 1050.1F defines noise sensitive areas as areas where noise interferes with normal activities associated with its use. Noise sensitive areas may include residential, educational, health, religious structures and sites, parks and recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites. FAA Order 1050.1F recommends applying accepted Federal Highway Administration guidance for the analysis and mitigation of construction related noise, and local ordinances may dictate specific construction-related noise constraints.

3.9.2 Resource Study Area and Methodology

This analysis focuses on and provides a quantitative estimation of noise from construction activities, including site preparation, fill activities, and EMAS construction. The Proposed Project would not affect or change aircraft operations at the Airport; therefore, analysis of potential noise impacts was limited to noise generated by project construction.

The evaluation of construction-related noise impacts followed guidance provided in the Federal Highway Administration Construction Noise Handbook.[81] Table 7.3 in the Construction Noise Handbook identifies different types of construction equipment and the noise levels they generate at 50 feet from the equipment. The noise analysis identified the typical noise levels generated by the different types of construction equipment anticipated to be employed for the project and the distance between the Proposed Project construction areas and the nearest noise-sensitive receptors (i.e., residences). **Table 3.9-1** identifies the construction equipment that would be used in completing the Proposed Project and the noise levels this equipment would generate at a distance of 50 feet. Construction noise was evaluated using these noise levels and applying a "point" source distance attenuation of 6 decibels (dB) per every 50 feet between the construction area and the nearest noise sensitive receptors.

TABLE 3.9-1
CONSTRUCTION EQUIPMENT NOISE EMISSION CRITERIA LIMITS

Equipment Description	Lmax Noise Limit (at 50 feet, decibel, slow)
Chain Saw	85
Chipper/Stump Grinder	85*
Concrete Truck	85
Dozer	85
Dump Truck	84
Excavator	85
Hydroseeder	85*
Loader	80
Off-Road Truck	85*
Other General Equipment	85*
Pickup Truck	55
Pumps	77
Roller	85*
Scraper	85
Skid Steer Loader	80
Tractors/Loader/Backhoe	84
Water Truck	85*

NOTE: * = Classified as other types of construction equipment

SOURCE: Federal Highway Administration, 2006. Construction Noise Handbook, Table 7.3: Example of Possible Construction Equipment Noise Emission Criteria Limits. FHWA-HEP-06-015; DOT-VNTSC-FHWA-06-02; NTIS No. PB2006-109102.

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[81] Federal Highway Administration, 2006. *Construction Noise Handbook, Table 7.3: Example of Possible Construction Equipment Noise Emission Criteria Limits*. FHWA-HEP-06-015; DOT-VNTSC-FHWA-06-02; NTIS No. PB2006—09102. Accessed in November 2021 at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm

3.9.3 Existing Conditions

The study area is generally neither remote in character nor quiet as it includes a busy airfield bordered by 4-lane highways and industrial and commercial uses. There are areas of residential development to the east and southeast of the Airport property across Lebanon Church Road at the Runway 28 end.

3.9.4 Environmental Consequences

3.9.4.1 Proposed Project

Construction activities associated with the Proposed Project would result in a temporary increase in ambient noise levels in the immediate vicinity of work areas on the Airport property, the surrounding areas, and on the haul routes used by construction equipment and dump trucks carrying fill material to the Proposed Project site. It is anticipated that the greatest noise increase would occur during site clearing, fill, and grading, but there would also be temporary noise associated with the installation of the EMAS beds beyond both runway ends. Some construction equipment would generate noise levels of approximately 85 dB as measured at 50 feet **(Table 3.9-1)**. Equipment that would be used would include, but may not be limited to, chain saws, chippers/stump grinders, concrete trucks, dozers, dump trucks, excavators, hydroseeders, off-road trucks, rollers, and scrapers. The proposed construction haul routes would avoid routing construction traffic through residential areas (see **Figure 3.10-2**). The proposed haul routes from Lebanon Church Road and State Route 885, both major thoroughfares, would utilize roads through unpopulated areas or areas devoted to industrial uses.

The nearest noise sensitive receptors are residences along Rodeo Drive, approximately 365 feet south of the Runway 28 end project area. Rodeo Drive is located across from the southern boundary of the Airport, beyond Lebanon Church Road, a busy, four-lane thoroughfare. The loudest average noise level produced 50 feet beyond the project area would be approximately 85 dB. At the closest noise receptor, the temporary, intermittent noise from construction activity would be approximately 45 dB (approximately the level of the average office space and quieter than an ordinary conversation at 3 feet).[82] Considering this low noise level, ambient noise from traffic on Lebanon Church Road, and intermittent noise from ongoing aircraft operations, it is unlikely that construction noise would be noticeable at this location.

In order to progress the construction phase, dump trucks carrying fill loads and other construction operations may run during nighttime hours. All construction activity would be conducted in compliance with local noise ordinances, which state that between 10 p.m. and 7 a.m. noise in excess of 55 dB cannot enter a residential community. The 45 dB anticipated at the nearest residential receptor is well within this requirement, and residents near to the Project area at the Runway 28 end are unlikely to be disturbed by nighttime construction operations should they occur.

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[82] U.S. Department of Housing and Urban Development, 1972. *Aircraft Noise Impact—Planning Guidelines for Local Agencies*.

3.9.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Project would not be built. As a result, there would be no increases in noise at the Airport.

3.9.5 Significance Determination and Best Management Practices

Given the type of construction associated with the Proposed Project and the distance from construction areas to noise-sensitive land uses, no significant construction noise impacts would occur. Due to attenuation and the existing industrial character of the Project area, temporary, intermittent noise from construction activities is not likely to be perceived by or distracting to nearby noise receptors.

3.10 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

A socioeconomic analysis evaluates how elements of the human environment might be affected by the Proposed Project and alternative(s). Socioeconomic impacts are generally associated with the loss or creation of jobs or significant tax base, depression or stimulation of economic activity, and inducement of population growth in an affected area. Environmental justice describes whether environmental impacts associated with a Proposed Project disproportionately effects minority and/or low-income communities and whether these communities have been provided the opportunity for meaningful involvement in project-related decisions. Finally, children may experience disproportionate health and safety risks due to exposure routes that differ from adult lifestyles or are attributable to products or substances that the child is likely to come in contact with or ingest.

3.10.1 Regulatory Context

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1994), directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations. DOT Order 5610.2 (1997), *Environmental Justice in Minority and Low-Income Populations*, implements EO 12898. Per FAA Order 1050.1F, the FAA is required to both consider the potential impacts of its projects on minority[83] and low-income[84] populations (environmental justice communities), as well as meaningfully engage these populations in the NEPA process.

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[83] DOT Order 5610.2(a) defines "minority population" as any readily identifiable group of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity "minorities" are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black not of Hispanic origin, or Hispanic.

[84] DOT Order 5610.2(a) defines "low income" as a person whose median household income is at or below the Department of Health and Human Services poverty guidelines (see https://www.hhs.gov/).

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risk*, requires federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children and ensure that its actions address any disproportionate risks.

3.10.2 Resource Study Area and Methodology

The Borough of West Mifflin, including the census tracts including and surrounding AGC, would be the areas most likely to experience any potential socioeconomic and physical environmental impacts as a result of the Proposed Project (**Figure 3.10-1**). Census tracts 4885 and 4886 are those directly adjacent to and encompassing AGC. U.S. Census Bureau data was used to describe socioeconomic conditions in the Proposed Project area, and this EA provides a qualitative analysis describing the potential for the Proposed Project and No Action Alternative to:

- Induce or deflate employment opportunity, economic activity, population, housing availability, or regional growth
- Impact public services (including the local transportation network)
- Disrupt or divide a community

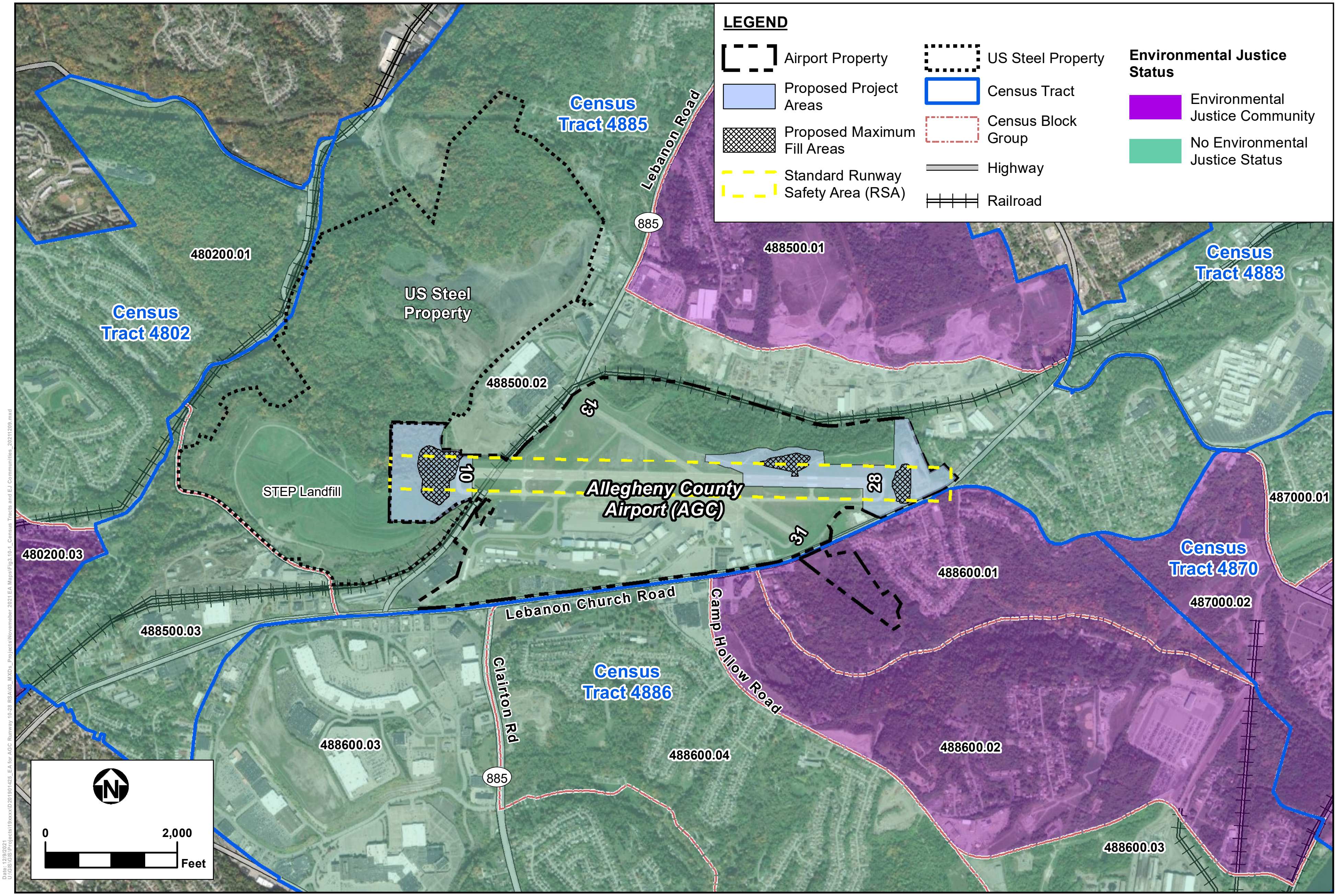
U.S. Census Bureau data was also used to determine if minority or low income communities (environmental justice communities) are located in proximity to AGC and to assess the potential vulnerability of specific communities or groups to environmental impacts identified throughout this EA.

For purposes of identifying the potential for the Proposed Project to result in risks to children, land uses that attract and are used by children, such as schools and parks, were identified within the Proposed Project study area.

3.10.3 Existing Conditions

3.10.3.1 Socioeconomics

The socioeconomic analysis evaluates how the Proposed Project potentially affects the human environment, including elements such as population, employment, housing, and public services. The following sections describe population, housing, and community; employment and economics; and transportation in the Proposed Project study area.



Source: Esri; U.S. Census Bureau, 2019; Adapted by ESA, 2021.

AGC RSA EA

FIGURE 3.10-1

ENVIRONMENTAL JUSTICE COMMUNITIES IN THE PROPOSED PROJECT AREA

Population, Housing, and Community

Table 3.10-1 summarizes historical population estimates and population projections for the Borough of West Mifflin and Allegheny County. Both areas experienced population decline between 2000 and 2019, and populations are projected to continue declining through 2040.[85]

TABLE 3.10-1
HISTORICAL AND PROJECTED POPULATION OF SELECTED GEOGRAPHIES IN THE STUDY AREA

	U.S. Census		ACS 2019 (5-year estimate)	DEP Population Projections		
	2000	2010	2019	2020	2030	2040
Allegheny County	1,281,666	1,223,348	1,221,744	1,179,072	1,155,460	1,136,415
Borough of West Mifflin	22,464	20,313	19,834	18,717	17,032	15,398

SOURCES: U.S. Census Bureau, 2000; U.S. Census Bureau, 2010; U.S. Census Bureau 2019a, Department of Environmental protection, no date.

In 2019, Allegheny County was estimated to have 600,399 housing units of which approximately 9.8% were vacant. In 2019, the Borough of West Mifflin was estimated to have 9,662 housing units of which approximately 8.9% were vacant. The census tracts included in the study area demonstrated similar vacancy rates with the exception of Census Tract 4802 and 4870, which had vacancy rates of 10.4% and 12.3%, respectively.[86]

Employment and Economics

Table 3.10-2 identifies the unemployment rate and median household income in the study area. Unemployment rates in the study area census tracts range from 1.7% in Census Tract 4883 to 9.4% in Census Tract 4802. Census Tracts 4870 and 4883 have unemployment rates that are significantly lower than those of the Borough of West Mifflin and Allegheny County as a whole. Census Tracts 4885 and 4886 have unemployment rates similar to those of the Borough of West Mifflin, and Census Tract 4802 has an unemployment rate that is significantly higher than that of Allegheny County, Borough of West Mifflin, or surrounding census tracts.

Median household incomes in the study area range from $34,776 in Census Tract 4870, which is significantly lower than the median household income for Allegheny County or the Borough of West Mifflin, to $86,188, which is significantly higher than that of Allegheny County or the Borough of West Mifflin.

AGC generated approximately $2 billion dollars in total economic output in 2017.[87] At that time there were 4,409 on-airport employees with labor income of $349 million. Overall, the aviation-

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[85] Pennsylvania DEP. *Population Projections Report*. Accessed in September 2021 at: https://files.dep.state.pa.us/Water/Division%20of%20Planning%20and%20Conservation/2010_2040PopulationProjections.pdf

[86] U.S. Census Bureau, 2019. *DP04 Selected Housing Characteristics; 2015–2019 American Community Survey 5-Year Estimates; selected geographies*.

[87] ACAA 2017. *Pittsburgh International Airport and Allegheny County Airport and the Allegheny County Airport Authority Economic Impact Study.* PennDOT 2011. *Pennsylvania Airports Economic Impact, the Economic Impact of Allegheny County Airport*.

related economic activities at AGC are responsible for an estimated 10,472 jobs on the airport and in the surrounding area. Activities supported by AGC generated $2.5 million dollars in annual state tax revenue and $1,854,000 in local tax revenue (2015 data).

TABLE 3.10-2
LABOR FORCE, UNEMPLOYMENT, AND MEDIAN HOUSEHOLD INCOME FOR POTENTIALLY AFFECTED JURISDICTIONS (5-YEAR ESTIMATES 2015-2019)

Jurisdiction	Civilian Labor Force	Unemployment Rate*	Median Household Income
Allegheny County	661,218	4.8%	$ 61,043
Borough of West Mifflin	10,037	6.7%	$ 42,321
Census Tract 4870 – Dravosburg	861	1.9%	$34,776
Census Tract 4883 – West Mifflin	1,024	1.7%	$60,938
Census Tract 4886 – West Mifflin (AGC south of Lebanon Church Road)	2,744	6.9%	$66,181
Census Tract 4802 – Baldwin Borough	1,879	9.4%	$86,188
Census Tract 4885 – West Mifflin (AGC north of Lebanon Church Road))	1,585	6.1%	$53,906

* Not seasonally adjusted.

SOURCE: U.S. Census Bureau, 2019

Surface Transportation

The Airport is accessed by Allegheny County Airport Road from two intersections along Lebanon Church Road. Lebanon Church Road is a major four-lane thoroughfare that runs from the southwest at the intersection of State Route 51 to just east of the Airport where it continues as a two-lane road at the intersection of Buttermilk Hollow Road. Lebanon Church Road is also accessed by way of Lebanon Road (State Route 885), which runs along the west of the Airport through a tunnel beneath the Runway 10 end. Clairton Boulevard (State Route 885), a major-four lane thoroughfare, connects to Lebanon Church Road from the south.

An analysis of existing peak hour traffic volumes using traffic data from PennDOT's Traffic Information Repository indicates that existing traffic operates at an acceptable level of service on the local road network.[88]

3.10.3.2 Environmental Justice

Minority and low-income communities in areas around AGC were identified using EJSCREEN, the USEPA's environmental justice screening and mapping tool, and the U.S. Census Bureau's 2015-2019 American Community Survey 5-Year Data Release.[89] Minority and low-income

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[88] Pennsylvania Department of Transportation, 2021. *Traffic Information Repository.* Accessed in November 2021 at: https://www.penndot.gov/ProjectAndPrograms/Planning/TrafficInformation/Pages/default.aspx

[89] USEPA, 2021. *EJSCREEN.* Accessed July and December 2021 at: https://www.epa.gov/ejscreen. US Census Bureau, 2020. *American Community Survey 2015-2019 5-Year Data Release* Accessed June and December 2021 at: https://www.census.gov/newsroom/press-kits/2020/acs-5-year.html

populations for each census block group in the study area were identified. Census block groups that have minority and/or low-income populations greater than or equal to their populations for the Borough of West Mifflin as a whole are identified as environmental justice communities. The average percentage minority population for the Borough of West Mifflin is 13.5%, and the percentage of people living below the poverty line is 13.9%. **Table 3.10-3** describes the demographics for the census block groups in which the Airport and surrounding areas are located. As shown, four census block groups (480200.03, 488500.02, 488600.01, and 488600.02) have a greater percentage minority population than the Borough of West Mifflin as a whole.[90] These census block groups represent environmental justice communities. All four of these census block groups, as well as Census Block Group 487000.02, indicate poverty rates greater than that of the Borough of West Mifflin. Census Block Group 487000.02 is also an environmental justice community. The environmental justice communities located in the AGC area are shown on **Figure 3.10-1**.

TABLE 3.10-3
SELECT RACIAL AND INCOME CHARACTERISTICS FOR RESIDENTS WITHIN THE STUDY AREA, 2015-2019

	Total Population	Percent Total Minority	Percent of People Living Below Poverty Level (2019)
Allegheny County	1,221,744	21.5%	11.6%
Borough of West Mifflin	19,834	13.5%	13.9%
Census Tract 4802	3,529	15.1%	5.5%
Census Block Group 480200.01	*2,203*	*3.5%*	*2.2%*
Census Block Group 480200.03	*784*	***51.3%***	***17.0%***
Census Tract 4885	2,817	9.5%	11.4%
Census Block Group 488500.01	*851*	*0.0%*	*1.4%*
Census Block Group 488500.02	*1,428*	***16.9%***	***21.6%***
Census Block Group 488500.03	*538*	*5.2%*	*0.0%*
Census Tract 4886	4,755	10.5%	12.2%
Census Block Group 488600.01	*850*	***17.9%***	***22.5%***
Census Block Group 488600.02	*566*	***37.3%***	***41.9%***
Census Block Group 488600.03	*1,083*	*0.0%*	*0.0%*
Census Block Group 488600.04	*2,256*	*6%*	*6.7%*
Census Tract 4883	2,046	3.3%	9.8%
Census Block Group 488300.01	*2,046*	*3.3%*	*9.8%*
Census Tract 4870	1,730	4.9%	10.2%
Census Block Group 487000.01	*744*	*6.2%*	*2.3%*
Census Block Group 487000.02	*986*	*3.9%*	***16.1%***

NOTES: Bolded numbers indicate that these census tracts are identified as minority or low-income populations.

SOURCE: 2015-2019 American Community Survey 5-year survey estimates.

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[90] Minority population represents the combined non-white and white and non-white Hispanic populations in each census block group.

3.10.3.3 Children's Environmental Health and Safety Risks

AGC is located in the West Mifflin Area School District. The West Mifflin School District operates one high school, one middle school, two elementary schools, and one online K-12 "cyber academy." The closest school to AGC is Clara Barton Elementary School, located approximately one mile south of the Airport. The Borough of West Mifflin operates one public park, West Mifflin Community Park, and 20 public playgrounds. In addition, the City of Pittsburgh operates two parks north of the Airport, McBride Park and Lincoln Place Parklet. West Mifflin Community Park is located approximately three miles east of the Airport and McBride Park and Lincoln Place Parklet are located approximately three miles north of the Airport. The closest playground is Edgewater Drive Park, located approximately two miles north of the Airport.

3.10.4 Environmental Consequences

3.10.4.1 Proposed Project

Socioeconomics

The socioeconomics analysis in this EA is focused on determining whether the Proposed Project would result in substantial economic impacts in the region, changes to the community tax base, or disruptions to local surface traffic conditions. Per guidance in the *FAA Order 1050.1F Desk Reference*, the analysis must consider certain factors, including whether a proposed action, when compared to the no action alternative, would:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or,
- Produce a substantial change in the community tax base.

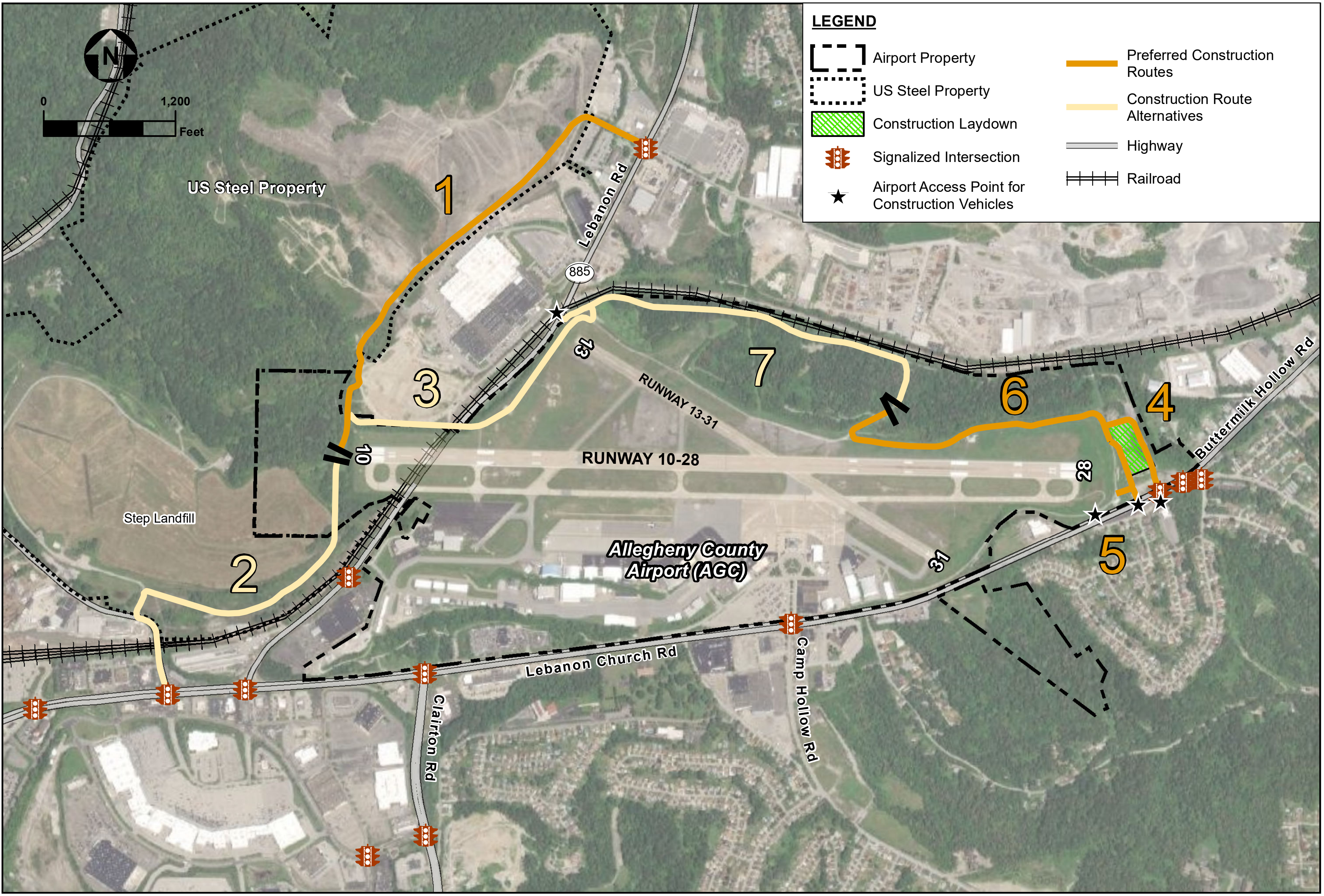
The determination of a significant impact is not solely reliant upon the presence of these factors, but rather by evaluating the context and intensity of each factor.

While the Proposed Project would include improvements to the RSAs, this activity would be limited to the Airport property and would not disrupt or divide the local community. The Proposed Project would not cause the relocation of businesses or employees and thus would not produce economic hardship or place a strain on local housing stocks. The Proposed Project may include temporary employment opportunities associated with construction of the RSAs. It is expected that these employment opportunities would be filled locally and would provide a direct economic benefit to the surrounding community. The temporary increase in employment opportunities associated with project construction would likely induce some minor local economic growth with a corresponding change in the community tax base due to use of local services by project employees.

A detailed traffic analysis was performed specific to the potential haul route alternatives (**Appendix G**). The Proposed Project would see a minor increase in motor vehicle traffic on area roads due to use by construction vehicles, including dump trucks. Construction activities associated with the Proposed Project would require an estimated total 30,986 truck trips to and from the Proposed Project area. Proposed construction haul routes are shown on **Figure 3.10-2**. Although the construction contractor will select the most efficient and accessible route, it is likely that construction vehicles (e.g., dump trucks) will access the Project area at the Runway 10 end from the north on State Route 885 and existing service roads on U.S. Steel property (route segment 1). Construction vehicles are likely to access the Project area at the Runway 28 end via existing airport service entrances on Lebanon Church Road (route 5) and access the fill areas on existing Airport service roads (segments 5 and 6). It is anticipated that typical peak hour truck traffic would include eight loads per hour (16 round trips per hour).

Table 3.10-4 shows existing and estimated weekday peak hour traffic associated with the Proposed Project. As shown, the increases in maximum weekday peak hour traffic volume on the roadways studied vary from 0.3 to 1.1 percent during construction. While the number of peak hour truck trips is anticipated to increase between seven and 14 percent on all major roads except for Clairton Road, this represents a less than two percent increase in overall peak hour traffic. Clairton Road (State Road 885) south of Lebanon Church Road (Lebanon Road is State Road 885 north of Lebanon Church Road), would see an approximate 24 percent increase in peak hour truck traffic. However, this represents just a one percent increase in total peak hour traffic. Therefore, construction trips are not anticipated to significantly degrade levels of service on area roadways. The complete traffic analysis is included in **Appendix G**.

The Proposed Project would not induce any new ongoing demand on transportation systems beyond the construction phase. Although construction-related traffic would not unduly strain the local road network, construction vehicles transporting fill and other material to the site would be limited to specific routes and times to account for the compressive strength of roadway materials and periods of high traffic. Incorporation of these mitigation measures is expected to moderate any potential temporary or permanent impacts to existing surface transportation systems and infrastructure. The completed Proposed Project will result in enhanced RSA safety, and is not anticipated to induce new surface traffic to AGC or any other parts of the surrounding community.



Source: Esri; GAI; Adapted by ESA, 2021.

FIGURE 3.10-2
NOTIONAL CONSTRUCTION HAUL ROUTE ALTERNATIVES

Date: 1/21/2022
U:\GIS\GIS\Projects\19xxxx\D201901425_EA for AGC Runway 10-28 RSA\03_MXDs_Projects\Novemeber 2021 EA Maps\Fig3.10-2_Notional Construction Haul Routes_20220121.mxd

TABLE 3.10-4
WEEKDAY PEAK HOUR TRAFFIC INCREASES DURING CONSTRUCTION

Roadway	Average Daily Traffic (Current)	Average Daily Truck Traffic (Current)	K Factor[1]	Existing Peak Hour Volume	Existing Peak Hour Truck Traffic	Peak Hour Traffic Percent Increase[2]	Peak Hour Truck Traffic Percent Increase[2]
SR 0885 (Lebanon Rd) North of AGC	17,621	1,525	8	1,410	122	1.1%	13.1%
SR 0885 (Lebanon Rd) South of AGC	25,035	2,626	7	1,752	184	0.9%	8.7%
SR 0885 (Clairton Rd) South of SR 0885	14,339	619	11	1,577	68	1.0%	23.5%
SR 2040 (Lebanon Church Rd) east of SR 0885[3]	25,594	1,154	10	2,559	115	0.3%	7.0%
SR 2040 (Lebanon Church Rd) west of SR 0885	32,203	1,988	10	3,220	199	0.5%	8.0%
SR 2047 (Delwar Rd)[4]	10,186	815	11	1,120	90	0.7%	8.9%
SR 0051 (Clairton Blvd) north of SR 2040	23,684	1,390	10	2,368	139	0.7%	11.5%
SR 0051 (Clairton Blvd) south of SR 2040	26,286	2,041	7	1,840	143	0.9%	11.2%

SOURCE: GAI Consultants, 2021. *Preliminary Construction Traffic Impact Review Allegheny County Airport Runway Safety Area Improvements Environmental Assessment*, November 16.

NOTES: SR = State Road

1. K factor is the percentage of average daily traffic occurring during the peak hour.
2. Percent increase assumes eight trucks per hour (16 round-trips) during construction.
3. Four trucks per hour assumed since roadway is assumed to only be used by trucks to Runway 28 and Midfield locations.
4. Four trucks per hour assumed since this roadway assumed to only be used by trucks to Runway 10.

The two transportation projects outlined in **Table 3.1-1** are not anticipated to interact with the Proposed Project in a way that would further impact service on local roads. The Mon-Fayette Expressway / Turnpike 43 Project segment identified for this location does not interfere with egress to or from the airport and would not displace existing traffic in a way that would intermingle with fill truck trips because it is a new roadway/not currently used, it is not located adjacent to the airport, and construction is not expected to occur within the same timeframe as the Proposed Project. Likewise, the Proposed Project construction timeframe is not anticipated to overlap with the Lebanon Church Rehabilitation Project in a way that would exacerbate local traffic. The Lebanon Church Road project will run adjacent to AGC and airport access points and includes the rehabilitation of existing pavement, road widening, and the construction of an Americans with Disabilities Act-accessible sidewalk along Lebanon Church Road from the Buttermilk Hollow intersection to Highway 885 (Lebanon Road) (**Figure 3.10-2**). Coordination between AGC and the Pennsylvania Department of Transportation is ongoing concurrent with this EA and final Project design to ensure the RSA Proposed Project and the Lebanon Church Road Rehabilitation project are compatible and do not interfere with public egress in this location.

Environmental Justice

Five census block groups (480200.03, 488500.02, 488600.01, 488600.02, and 487000.02) have been identified as environmental justice communities. As no significant environmental impacts associated with the Proposed Project have been identified, the Proposed Project would not result in disproportionately high and adverse human health or environmental effects to the identified environmental justice communities.

Children's Environmental Health and Safety Risks

AGC property is fenced, and there are no schools, parks, or other locations where children would spend time located within close proximity to AGC. The closest school, Clara Barton Elementary School, located approximately one-mile south of the Airport, is not near the proposed construction truck access routes for the Proposed Project and is unlikely to be affected by construction activities that might represent environmental health and safety risks to children. Similarly, the closest parks and playground are not near the proposed construction truck access routes and are unlikely to be affected by construction activities that might represent environmental health and safety risks to children.

3.10.4.2 No Action Alternative

Socioeconomics

Under the No Action Alternative, the RSAs at AGC would not be improved and there would be no physical development with potential to disrupt or divide the local community. Furthermore, there would be no potential for relocation of employees or additional strain on local housing stocks. While the Airport provides economic benefits to the community, there would be no potential for an increase in these benefits under the No Action Alternative. Finally, there would be no increase in traffic volume on area roadways under the No Action Alternative. Accordingly, no significant socioeconomic impacts would occur under the No Action Alternative.

Environmental Justice

As previously discussed, five census block groups (480200.03, 488500.02, 488600.01, 488600.02, and 487000.02) have been identified as environmental justice communities. Under the No Action Alternative, improvements to the RSAs at AGC would not occur and there would be no impacts to the identified environmental justice communities.

Children's Environmental Health and Safety Risks

Under the No Action Alternative, improvements to the RSAs at AGC would not occur. There are no existing risks to children's health or safety that would increase with the No Action Alternative as there are no schools or parks in close distance to AGC or adjacent to proposed construction haul routes and the airport is fenced with controlled access.

3.10.5 Significance Determination and Best Management Practices

The FAA has not established significance thresholds for socioeconomics, environmental justice, or children's environmental health or safety risks. The FAA has identified factors to consider in determining whether a Proposed Project would result in a significant socioeconomic impact. Because the Proposed Project would not produce substantial economic growth in undeveloped areas, disruption of the physical arrangement of established communities, extensive relocation of residents without available sufficient relocation housing, relocation of businesses that would create severe economic hardship, a substantial loss in community tax base, or a substantial degradation of level of service on area roadways, the Proposed Project would not result in a significant socioeconomic impact.

While the FAA has not identified a significant impact threshold for environmental justice, it has been established that an impact may occur if a Proposed Project would cause a disproportionate and adverse effect on low-income or minority populations. Based on the lack of significant impacts identified for all environmental resource categories evaluated in this EA, it is determined that the Proposed Project would not result in significant environmental justice impacts.

As discussed in FAA Order 1050.1F, while no significance threshold has been established for identifying significant impacts related to children's environmental health and safety risks, the factor to consider in determining whether there is a significant impact is whether a Proposed Project would have the potential to lead to a disproportionate health or safety risk to children. As previously discussed, there are no schools, parks, or other locations where children would spend time located within close proximity to AGC and the airport is fenced with controlled access. As stated in Sections 3.2 and 3.9, the Proposed Project would not result in any significant air quality or noise impacts that might affect the health of children. Furthermore, as discussed in Section 3.5, there is no potential for release of identified or heretofore undiscovered hazardous materials that would be harmful to children. Accordingly, the Proposed Project would not produce significant children's environmental health or safety risk impacts.

3.11 Visual Effects

3.11.1 Regulatory Context

Beyond FAA Order 1050.1F, there is no other specific regulatory context for evaluating the visual effects of a project. The FAA 1050.1F Desk Reference states that an assessment of potential impacts to visual resources is required to consider the what extent a Proposed Project could produce light emissions with potential to interfere with activity or cause annoyance or otherwise degrade the visual character of an existing environment.

3.11.2 Resource Study Area and Methodology

Per Section 13.3.3 of the FAA Order 1050.1F Desk Reference, the analysis of potential visual effects impacts was completed by reviewing land uses surrounding the Airport for sensitivity to light emissions as well as the potential for the Proposed Project to interfere with the aesthetics and visual character of the surrounding areas. These factors are defined as follows:

- Light Emissions Effects
  - Create annoyance or interfere with normal activities from light emissions;
  - Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.
- Visual Resources and Visual Character Effects
  - Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
  - Contrast with the visual resources and/or visual character in the study area; and
  - Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

3.11.3 Existing Conditions

As described in Section 3.7, AGC is located in a highly developed area, including industrial, commercial, and some residential uses, and as such has visual character typical of these uses with some natural forest area to the north/northwest. The airport is situated on a hill and, excluding components of the Runway 28 localizer, is generally not visible from adjacent locations. Dense vegetation along the Airport fence line and the varying topography generally block views west to the Airport.

Existing light sources at the Airport primarily include runway and taxiway lights, lighted airfield directional signage, and light from navigational equipment. The Airport has a rotating beacon that emits alternating white and green flashes of light from sunset to sunrise that identifies the location of the Airport from a distance at night. Other light sources include lighting on the terminal area buildings, hangars, warehouses, and parking area.

3.11.4 Environmental Consequences

3.11.4.1 Proposed Project

The Proposed Project is unlikely to introduce new light sources to cause annoyance or effect the visual character of the area. There would be no new physical development that would introduce new fixed light sources to the Airport, and light sources associated with construction would be unlikely as most activities would be confined to daylight hours. If nighttime construction operations were to occur and additional night lighting were required, because of the distance between the nearest residential development and the Airport, the degree of vegetation along the Airport boundaries, and the Airport's location on a hilltop, it is not likely that light emissions would be perceived by sensitive receptors (i.e., adjacent residential communities).

It is also unlikely that the Proposed Project would detract from surrounding visual resources. The Proposed Project does not include development that would result in new buildings or other structures that would interfere with visual resources or the visual character of the surrounding area.

While construction equipment would be noticeably present on the Airport property during development of the Proposed Project, because of the distance between the Airport and surrounding development, the degree of vegetation along the Airport boundaries, and the Airport's location on a hilltop, the temporary presence of construction equipment and construction activities would be unlikely to be observed beyond the airfield.

3.11.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Project would not be built. Therefore, there would be no new sources of light emissions or effects to the visual character of the areas surrounding the Airport. Light emissions at the Airport would remain limited to the airport buildings and parking area. Visual resources and character would remain unchanged and continue to reflect a typical general aviation airport.

3.11.5 Significance Determination and Best Management Practices

The Proposed Project would not result in any significant visual effects to the visual environment of AGC or surrounding areas.

3.12 Water Resources (Wetlands, Floodplains, Surface Water, Groundwater)

Water resources include wetlands, floodplains, surface water, and groundwater – interconnected components of functional watershed systems and crucial elements of the human environment. *Wetlands* are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. *Floodplains* are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and functions. A floodplain is defined as the lowlands and relatively flat areas adjoining inland and coastal waters, including flood prone areas of offshore islands that are, at a minimum, prone to the 100-year flood or a flood having a 1 percent chance of occurring in any given year. *Streams and Rivers* are naturally occurring, navigable bodies of water defined by the USACE as perennial, intermittent, or ephemeral. *Groundwater* is subsurface water that occupies the space between sand, clay, and rock formations.

3.12.1 Regulatory Context

The primary federal laws protecting the nation's waters are outlined below.[91] The Pennsylvania Department of Environmental Protection Division of Water Quality protects and manages clean water and public health in the state pursuant to portions of the *Pennsylvania Clean Streams Law* (Public Law 1987-394-1937) and federal Clean Water Act.

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[91] Other crucial laws related to water resources not detailed here include the *Rivers and Harbors Act of 1899* and the *Water Quality Act of 1987* (Public Law 100-4).

The *Clean Water Act of 1972* (Public Law 95-217) establishes a regulatory framework to reduce pollutant discharges into waterways and manage polluted runoff. The Pennsylvania DEP oversees most Clean Water Act regulations and jointly administers the Section 404 program with the USACE. Key components of the Clean Water Act pertinent to the Proposed Project include the following sections:

- *Sections 303 and 304* provide for water quality standards, criteria, and guidelines. Section 303(d) authorizes states to identify impaired waters that do not meet standards for their designated uses, and develop Total Maximum Daily Loads, which establish the maximum amount of a pollutant allowed in a waterbody.
- *Section 401* requires that states certify water quality associated with activities that result in discharges of dredged or fill material into jurisdictional water bodies. Section 401certification is required for any activity (including but not limited to the construction or operation of facilities) that may result in any discharge into navigable waters.
- *Section 402* regulates point-source and nonpoint-source discharges to surface waters through the NPDES program.
- *Section 404* protects Waters of the U.S., which include wetlands, rivers, and perennial streams. Additionally, EO 11990, *Protection of Wetlands*, directs federal agencies to take action to minimize the destruction, loss, or degradation of wetlands on their property and mandates review of proposed actions on wetlands through procedures established by NEPA. A permit is required from the Department of the Army, Corps of Engineers (USACE) for discharges of dredge or fill material into waters of the U.S. In coordination with the Federal Section 404 requirements, applications for potential wetland impacts are made directly to the Pennsylvania DEP or through a joint permit application process with the Pennsylvania DEP and the USACE.[92] Although impacts are permitable, they must first be avoided and minimized to the greatest extent practicable, and as a last resort, mitigated if avoidance and minimization is not possible.

Safe Drinking Water Act of 1972 (Public Law 93-523) and Amendments of 1986 (Public Law 99-339) protects sole source aquifers or recharge areas and authorizes the USEPA to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water.

Executive Order 11988, Floodplain Management (1977) addresses potential development in the nation's floodplains. The EO requires that actions avoid floodplains, and, if no practicable alternative exists, to design actions to minimize risk of loss of human life, damage to property, or interruption of the natural and beneficial values of floodplain resources. Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on a 100-year floodplain (7 CFR 650.25). The Federal Emergency Management Agency identifies flood hazard areas that are depicted on Flood Insurance Rate Maps.

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[92] Pennsylvania Code, Title 25 – Environmental Protection, Chapter 105 *Waterways and Wetlands Program.*

3.12.2 Resource Study Area and Methodology

A thorough review of publicly available resources, prior studies, and known site conditions was conducted to characterize water resources within the study area. Database searches included:

- USFWS National Wetlands Inventory database[93]
- Collective Efforts Wetland Delineation and Stream Identification Report for the Allegheny County Airport Property, February 2016
- Collective Efforts Proposed Project Wetland Delineation and Stream Evaluation, June 2021

A team of environmental scientists conducted onsite field surveys in June 2021, to characterize the surface water and wetland resources within the Proposed Project area. These surveys included pedestrian surveys, site-specific delineations of wetlands, and characterization of streams and other surface waters, and a technical report detailing these actions is available in **Appendix H**. Wetland and waterbody features identified within the study area are classified according to the Cowardin classification system[94] and identified based on field delineations of the approximate wetland jurisdictional boundaries in accordance with federal and regional guidelines.[95]

A preliminary evaluation of groundwater resources was performed by a team of geologists in February 2021, as part of the Preliminary Geotechnical Survey associated with the Proposed Project (**Appendix E**).[96] A total of nine borings were drilled to characterize the subsurface conditions within the project site, and geotechnical and environmental laboratory tests were performed to provide anticipated geologic and groundwater conditions and the potential effects on construction.

3.12.3 Existing Conditions

The Proposed Project footprint is chiefly located within the Streets Run-Monongahela River watershed (**Figure 3.12-1**).[97] Photos and additional details describing the water resources summarized below are available in **Appendix H**.

Wetlands. The study team identified no wetlands within the Proposed Project footprint at either Runway end. One palustrine emergent wetland (identified as WET-1), approximately 0.06 acres in size, is located outside of the proposed maximum fill area at the Runway 10 end (**Figure 3.12-2**). These types of wetlands are typically characterized by aquatic plants, such as cattails (*Typha sp.*), arrow arum (*Petandra viginica*), black willow (*Salix Negra)*, pin oak (*Quercus palustris*),

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[93] US Fish and Wildlife Service, 2021. *National Wetlands Inventory, Wetlands Mapper.* Accessed in June, 2021 at: https://www.fws.gov/wetlands/.

[94] Cowardin, Carter, Golet, and LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*.

[95] USACE 1987, *U.S. Army Corps of Engineers Wetland Delineation Manual*; USACE, U.S. Environmental Protection Agency (EPA), USDA NRCS, and USFWS 1989, Federal Manual for Identifying and Delineating Jurisdictional Wetlands; USACE 2012, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region.

[96] ACAA, 2021. *Preliminary Geotechnical Exploration Report for the Runway 28 Safety Area Improvement Project AGC, Pennsylvania*.

[97] US Geological Survey, 2021. *National Hydrography Dataset, Watershed Boundary Dataset.* Accessed in July 2021 at: https://www.usgs.gov/core-science-systems/ngp/national-hydrography/national-hydrography-dataset?qt-science_support_page_related_con=0#qt-science_support_page_related_con and Pennsylvania DEP, 2021. *PaEmapper* Accessed in July 2021 at: https://gis.dep.pa.gov/emappa/.

elderberry (*Sambucus sp.*), and soft rush (*Juncus effusus*), and are frequently used by wildlife (such as birds like storks, herons, waterfowl, and ducks and mammals like white tail deer, muskrats, beavers, shrews, and mice) for nesting and feeding, particularly during migration. Additionally, a wetland mitigation area associated with the U.S. Steel STEP is located northwest of the Proposed Project footprint at the Runway 10 end.[98]

Floodplains. AGC was constructed on top of a hill. Per the Federal Emergency Management Agency Flood Insurance Rate Maps for the Proposed Project location,[99] the Proposed Project area is not located within or adjacent to any floodplains, and the nearest stream is Streets Run, approximately 0.6 miles from the Runway 10 RSA construction area (**Appendix H**). Thus, no impacts to floodplains are anticipated and floodplains are eliminated from further analysis.

Surface Water. Surface waters are identified as either natural channels or other surface waters (OSWs). Natural channels are drainages that, although may convey stormwater, were not constructed for that purpose by humans and may display more natural stream features such as sinuosity, pools, and riffles and may support aquatic plants and wildlife. OSWs include manmade stormwater ponds and drainage features, such as upland-cut ditches and riprap-lined ditches, designed and constructed to convey stormwater. AGC actively manages OSWs to reduce their attractiveness to wildlife.[100]

The June 2021, onsite stream evaluation associated with the Proposed Project resulted in the identification of 13 channels within the Proposed Project area (**Figure 3.12-1; Table 3.12-1**). Nine channels were identified at the Runway 10 area (**Figure 3.12-2**), two channels were identified at the Runway 28 area (**Figure 3.12-3**), and two channels were identified at the mid-Runway 28 end (**Figure 3.12-4**). All 13 channels drain to the Monongahela River.

Streams and Rivers: Of the 13 identified channels in the Project area, 6 channels or a total of 1,531 linear feet are determined to be natural stream channels (**Table 3.12-1**). All of these natural stream channels are located at the Runway 10 end (**Figure 3.12-2**).

The Pennsylvania DEP has listed the surface water within and adjacent to the site (South Taylor tributary, North Taylor tributary, and Streets Run) as impaired waters due to metals from abandoned coal mine drainage and other land uses. Streets Run is impacted by aluminum, iron, and

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[98] USEPA 2017. *Documentation of Environmental Indicator Determination, RCRA Corrective Action Environmental Indicator RCRIS code (CA725) - Current Human Exposures Under Control*. Seep water is collected from the North Taylor tributary to Streets Run, and treated prior to discharge to the North Taylor tributary. The treatment system includes neutralization of acid mine drainage with slag, then treatment of the slag discharge through a constructed wetland area.

[99] Federal Emergency Management Agency, 2014. *Flood Insurance Rate Map* #42003C0481H and #42003C0477H, accessed in October, 2021 at: https://www.fema.gov/flood-maps/national-flood-hazard-layer.

[100] As it is not a Part 139 airport, AGC is not required to and has not developed an airport-specific Wildlife Hazard Management Plan (WHMP); however, ACAA aligns wildlife and landscape management techniques outlined in the *Pittsburg International Airport WHMP* (ACAA 2016).

low pH.[101] The Monongahela River is impacted by chlordane, PCBs, and inorganics.[102] Peters Creek is impaired from aluminum, iron, manganese, and low pH.[103]

Other Surface Waters: a total of 7 channels were identified as OSWs during field investigations, most of which are riprap-lined channels that intermittently convey airport stormwater runoff from the runways and other impermeable surfaces through constructed outfalls during precipitation events (**Table 3.12-1**). The OSWs observed all contained constructed outfall and/or inlet structures. These are all manmade features that were constructed during or after airport development and as such do not show up on Pennsylvania DEP historical streams database. The outfalls contributing to these OSWs are included in the AGC NPDES permit.

Swales and ditches are OSWs that are engineered to convey stormwater runoff from paved surfaces or developed areas, and they can occur on a spectrum from grassed, riprap-lined, or concrete flumes. Various swales exist within the airport property and Proposed Project area, but, as they are not regulated by the USACE, they are not specifically delineated or analyzed for potential impacts from the Proposed Project. Revisions to the existing stormwater management system as necessary to accommodate the proposed construction will be included in the final project design.

Groundwater. No public groundwater sources are located within Airport property. Groundwater at AGC is assumed to flow through watersheds like adjacent surface waters and likely moves from the higher elevations of the airport down through the respective basins. The preliminary geotechnical study performed for this project observed groundwater in some borings at depths between 7.6 and 14.2 feet below the ground surface[104] (**Appendix E**), and other activities at the U.S. Steel STEP have noted that groundwater in this area was highly impacted by historic coal mining operations and its depth and location is highly variable and unpredictable.[105] Shallow groundwater was only sporadically encountered beneath the site and at varying elevations, and it is anticipated that the encountered groundwater may represent perched conditions that may be seasonally present.[106] Some existing groundwater contamination was observed, which is further discussed in Section 3.5.

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[101] Pennsylvania DEP, 2009. *Streets Run Watershed TMDL, Allegheny County, For Abandoned Mine Drainage Affected Segments.* Accessed in November 2021 at: https://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/TMDL/Streets%20Run%20FinalTMDL.pdf

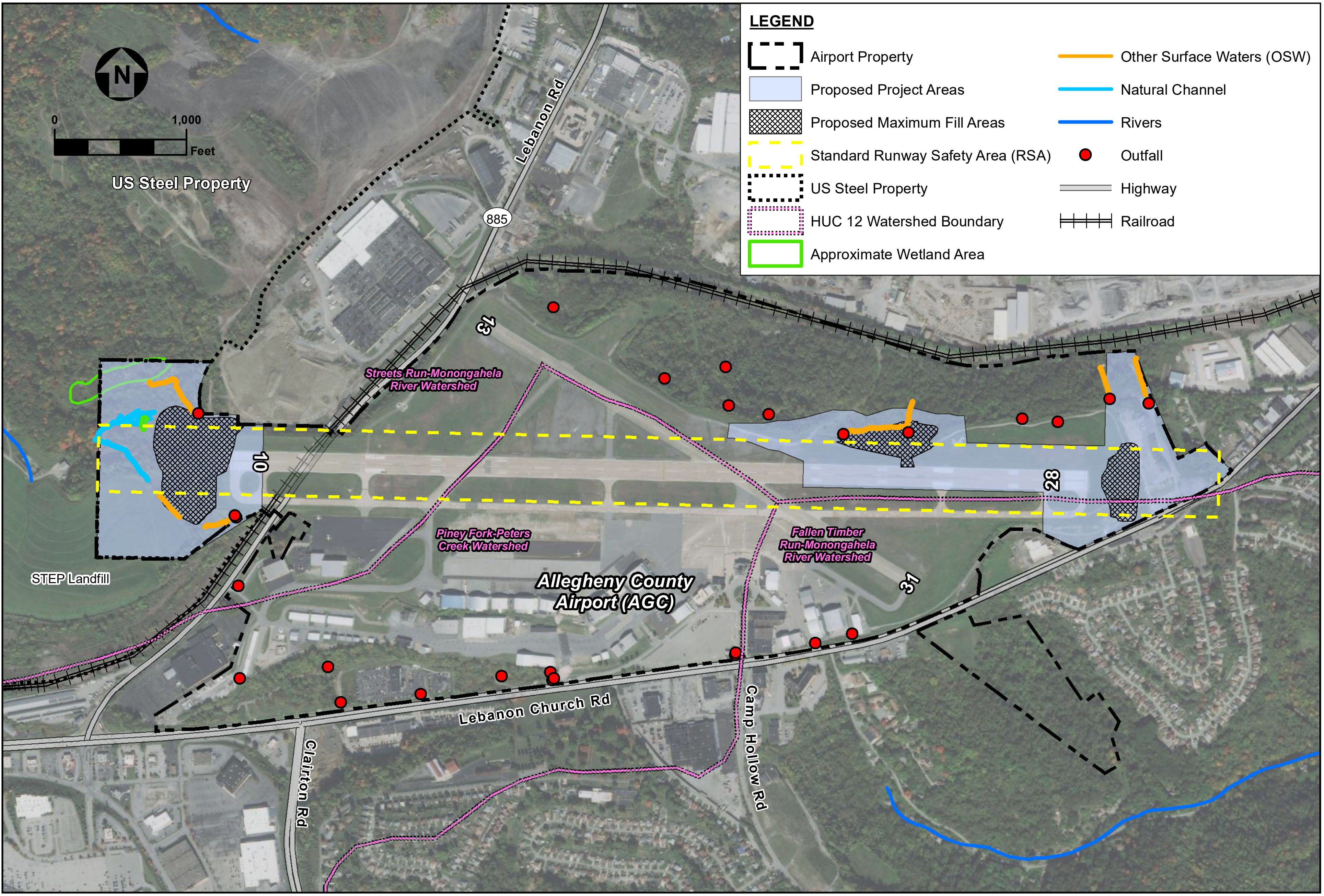
[102] Pennsylvania DEP, 1999. *TMDL for the Monongahela River, Greene County PCBs and Chlordane*. Accessed in November 2021 at: https://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/TMDL/Monongah_TMDL.pdf.

[103] Pennsylvania DEP, 2009. *Peters Creek Watershed TMDL: Allegheny and Washington Counties, for Mine Drainage Affected Segments.* January 6. Accessed in November 2021 at: https://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/TMDL/Peters%20Creek%20Final%20TMDL.pdf.

[104] ACAA, 2021. *Preliminary Geotechnical Exploration Report for the Runway 28 Safety Area Improvement Project AGC, Pennsylvania*.

[105] U.S Steel Corporation, 2020. *Draft Phase IIC Project Summary Report, Groundwater Monitoring Network Evaluation Hazardous and Residual Waste Landfills, South Taylor Environmental Park, West Mifflin, Pennsylvania.* November

[106] ACAA, 2021. *Preliminary Geotechnical Exploration Report for the Runway 28 Safety Area Improvement Project AGC, Pennsylvania*.

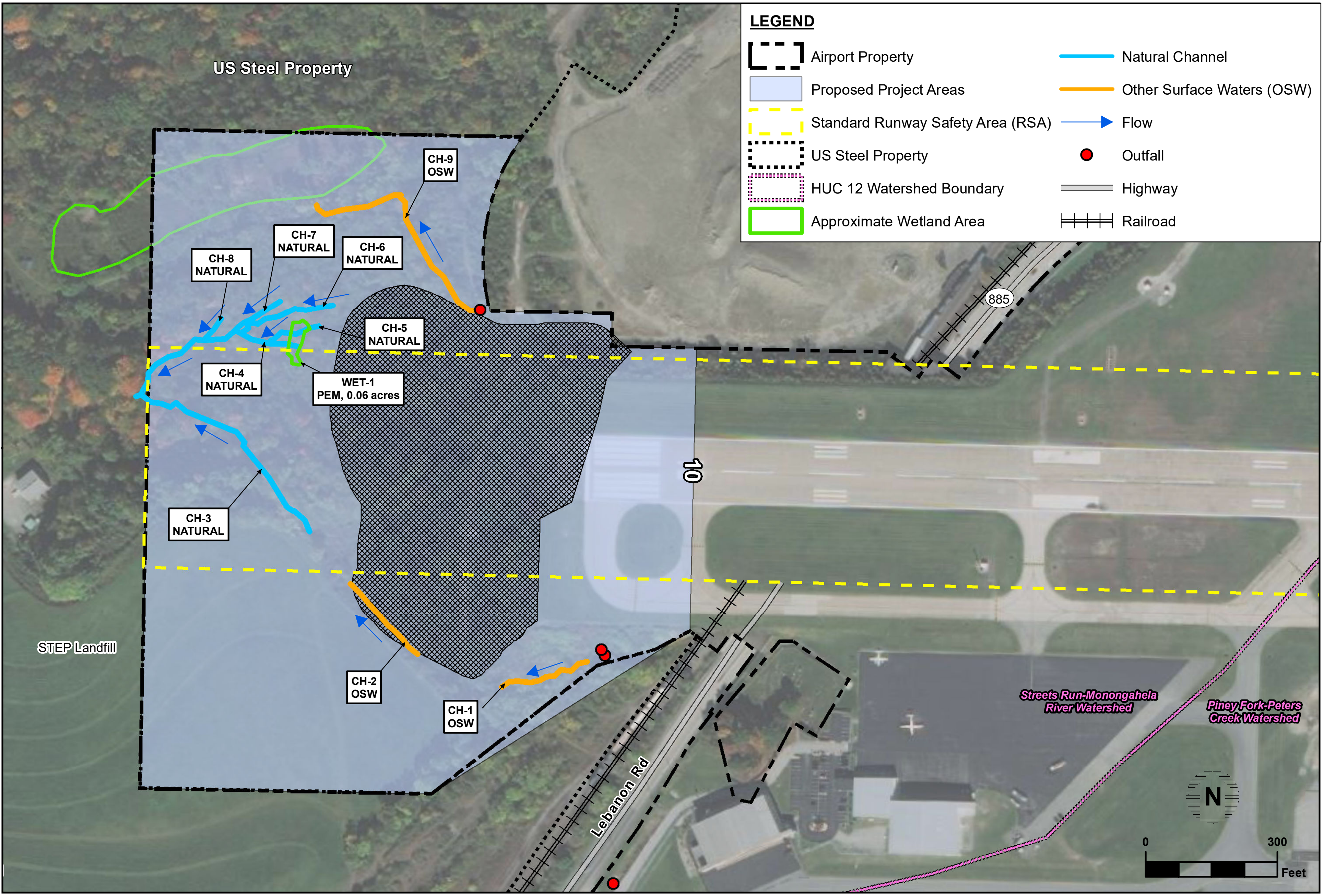


Source: Esri; Collective Efforts, 2021; PA Spatial Data Access PAeMap; Adapted by ESA, 2022.

AGC RSA EA

FIGURE 3.12-1

WATER RESOURCES IN THE STUDY AREA



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Source: Esri; Collective Efforts, 2021; PA Spatial Data Access PAeMap; Adapted by ESA, 2022.

AGC RSA EA

FIGURE 3.12-2

WATER RESOURCES AT THE RUNWAY 10 END

Date: 1/14/2022
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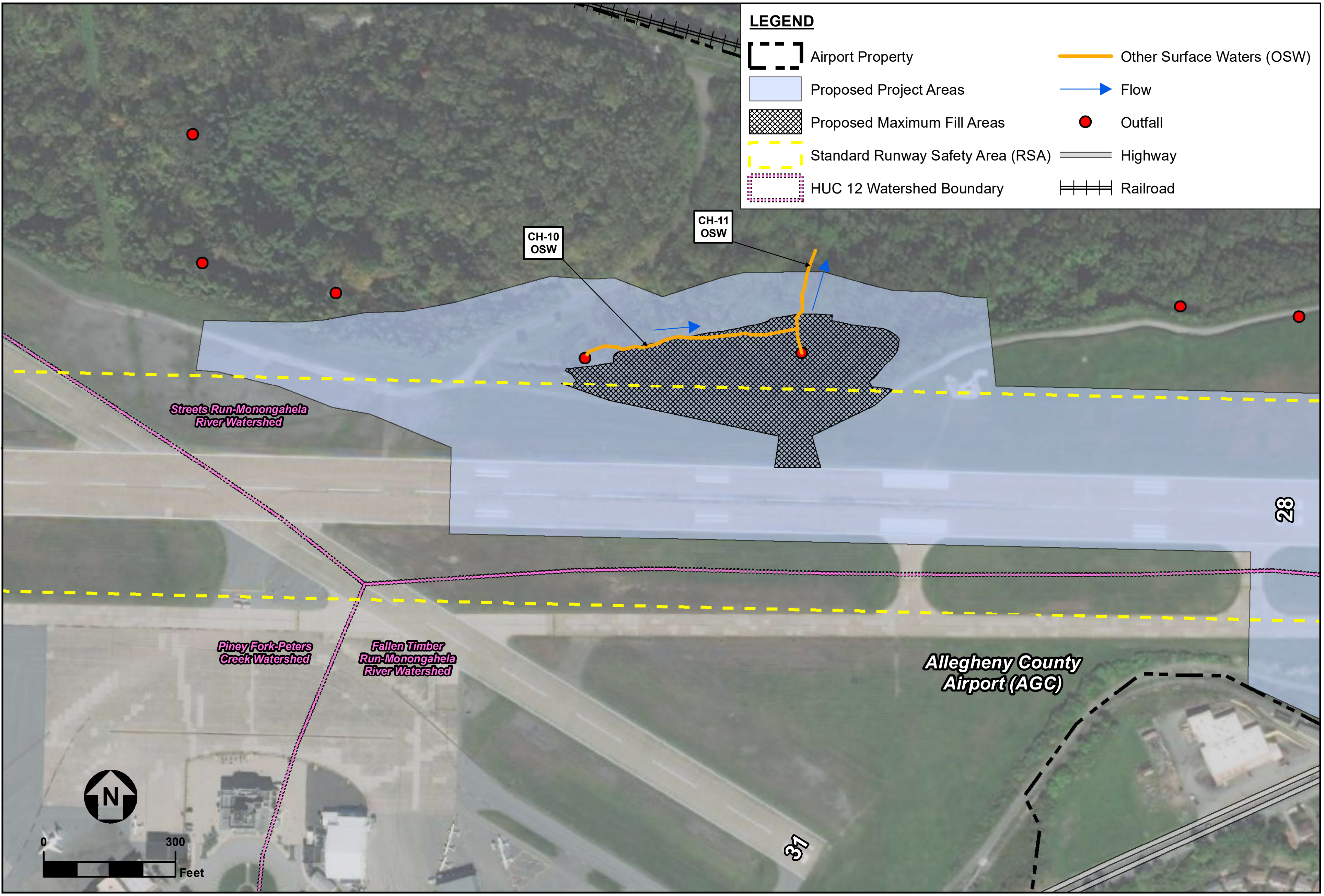
Source: Esri; Collective Efforts, 2021; PA Spatial Data Access PAeMap; Adapted by ESA, 2022.

FIGURE 3.12-3

WATER RESOURCES AT THE RUNWAY 28 END



Date: 1/14/2022
U:\GIS\GIS\Projects\19xxxx\D201901425_EA for AGC Runway 10-28 RSA\03_MXDs_Projects\January 2022 EA Maps\Fig3.12-4_Water Resources at the Mid-Runway 28 End_20220114.mxd

Source: Esri; Collective Efforts, 2021; PA Spatial Data Access PAeMap; Adapted by ESA, 2022.

FIGURE 3.12-4
WATER RESOURCES AT MID AIRFIELD

TABLE 3.12-1
SURFACE WATER RESOURCES IN THE PROJECT AREA

Surface Water Resource		Presence in Proposed Project Area	Location (associated with Runway 10 or 28 ends)	Observed Flow during 6/2021 Field Review	Characteristics
Wetlands	Wetland 1 (WET-1)	0.06 acres	10	NA	Palustrine emergent.
Surface Water					
Natural	Channel 3 (CH-3)	535 feet	10	yes	Perennial. Steep channel that flows west down hillslope. Converges with CH-4 at the bottom of the hillslope outside of the Proposed Project area.
	Channel 4 (CH-4)	448 feet	10	yes	Perennial. Flows southwest down the hillslope. Begins at WET-1.
	Channel 5 (CH-5)	128 feet	10	yes	Perennial. Flows west, through WET-1, into CH-4.
	Channel 6 (CH-6)	234 feet	10	yes	Perennial. Flow west off wooded hillslope into CH-4.
	Channel 7 (CH-7)	122 feet	10	yes	Perennial. Flow west off wooded hillslope into CH-4.
	Channel 8 (CH-8)	64 feet	10	yes	Perennial. Flow west off wooded hillslope into CH-4.
OSWs: engineered stormwater management infrastructure	Channel 1 (CH-1)	214 feet	10	no	Steep channel that flows from the top of the runway to the west before reaching the access road.
	Channel 2 (CH-2)	223 feet	10	no	Manmade ditch. Observed piping at both ends of the stream to channel it under the access roads and geo lining.
	Channel 9 (CH-9)	551 feet	10	yes	Channel begins at a stormwater outfall located within the project footprint. Flows north off hillslope into channelized section of access road. Flows into the North Taylor Landfill wetland.
	Channel 10 (CH-10)	494 feet	mid-28	no	Begins from a stormwater outfall off of an existing access road. Flows east down wooded hillslope into CH-11. Contains riprap throughout portions of the channel near the outfall. Channels drain active airport area through outfalls and are not present on the PAeMap historical stream layer; thus, are recommended as not USACE-regulated.
	Channel 11 (CH-11)	246 feet	mid-28	no	Begins from a stormwater outfall on wooded hillslope. Flows north down the hillslope. Contains riprap on the upstream end of the channel near the outfall. Channels drain active airport area through outfalls and are not present on the PAeMap historical stream layer; thus, are recommended as not USACE-regulated
	Channel 12 (CH-12)	249 feet	28	no	Roadside ditch reinforced with rip rap lining and gabion netting. Begins from an outfall and flows north.
	Channel 13 (CH-13)	294 feet	28	no	Roadside ditch reinforced with rip rap throughout the channel. Flows north off of the existing access road into wooded hillslope.

3.12.4 Environmental Consequences

3.12.4.1 Proposed Project

Surface Water. A total of 1,531 linear feet of natural channel at the Runway 10 end are within the Proposed Project area; however, no natural stream segments are identified within any of the Proposed Project footprint/fill areas and a minimum 50-foot setback will be enforced between existing streams and areas of ground disturbance (**Table 3.12-2**). All water resources within the Proposed Project footprint are considered OSWs, and permitting is not likely to be required for relocating manmade stormwater conveyance structures. OSW channels that cannot be avoided are likely to be re-routed/re-established around the fill area or as appropriate to drain the newly established slopes as determined during final project design.

TABLE 3.12-2
POTENTIAL DIRECT IMPACTS TO STORMWATER INFRASTRUCTURE RESOURCES IN THE PROJECT FOOTPRINT

Surface Water Resource		Total (linear) Presence in Proposed Project Area	Location	Area of Impact (linear feet)
OSW	Channel 10 (CH-10)	494 feet	Mid-R28	411.36 feet
	Channel 11 (CH-11)	246 feet	Mid-R28	97.14 feet
	Channel 2 (CH-2)	223 feet	R10	171.94 feet
	Channel 9 (CH-9)	551 feet	R10	38.06 feet
TOTAL		**1,514 feet**		**868 feet**

In the absence of appropriate best management practices, which are often identified during permitting processes, the earth moving activities associated with the Proposed Project could trigger excessive erosion and sedimentation that would impact water quality within the Streets Run and Monongahela River basins. These sediments may carry nutrients, heavy metals/mercury, pesticides, or other pollution that could further exacerbate the impairment status of these systems. However, such negative impacts to water quality and stormwater management would be avoided and minimized to the extent possible through the application of best management practices and adherence to water quality permit requirements. The final grade of most slope areas is anticipated to be 1:2 (or 1.5:1 in small, isolated areas to avoid resources or property boundaries as needed) and drainage features would be designed in order to arrest overland flow velocity and minimize erosion potential. After construction is complete, vegetation on the slopes would be established and maintained.

Further coordination with the Pennsylvania DEP may occur as necessary during final site design and construction permitting phases. Modifications to the AGC general NPDES permit for stormwater (No. PAG-03) would likely be necessary if the proposed fill impacts AGC's existing outfalls, but no minimum setback to adjacent OSWs is required. A NPDES General Permit for stormwater discharges associated with construction activities is required for projects at that disturb more than 1 acre. The NPDES permit will include an Erosion and Sediment Control Plan, a Post-

Construction Stormwater Management Plan, a threatened and endangered species search, and municipal notification. The Post-Construction Stormwater Management Plan details erosion control, sediment control, waste management, and other general best management practices to be implemented onsite to protect water quality. Land development and construction guidance provided in FAA Advisory Circular 150/5370.10G, *Standards for Specifying the Construction of Airports*, would also be incorporated into the Proposed Project plans and specifications to reduce potential for erosion and minimize construction-related impacts. AGC also maintains and implements site-specific pollution prevention plans and requires best management practices to protect water resources during construction.

Groundwater. The Proposed Project would clear existing slopes and compact clean fill on top of cleared surfaces. In some areas the topography would be elevated 50 feet above the existing grade, and as such, the Proposed Project is likely to alter the existing flow rate and depth to groundwater, as well as existing superficial recharge characteristics within the fill footprint. Because clean fill would be used, it is not likely that the Proposed Project will further contaminate existing groundwater.[107] The Proposed Project would not involve the use of groundwater and would not affect a sole source aquifer or the Pennsylvania Comprehensive State Groundwater Protection Program (1998).

Groundwater contamination and its implications to worker safety is further evaluated in Section 3.5. If planned construction activities would involve dewatering, a Groundwater Management Plan may be required, including procedures for the proper management, storage, sampling, transportation, infiltration, and/or disposal of potentially impacted groundwater.

3.12.4.2 No Action Alternative

Under the No Action Alternative baseline conditions for water resources would continue and no additional impacts to these resources would be anticipated.

3.12.5 Significance Determination and Best Management Practices

Surface Water. FAA Order 1050.1F states that surface water impacts are significant if the proposed action would: 1) exceed water quality standards established by Federal, state, local, and tribal regulatory agencies, or 2) contaminate public drinking water supply such that public health may be adversely affected.

Implementation of erosion control best management practices and pollution prevention measures would minimize the potential for substantial water quality impacts during construction. The Proposed Project would include modification to the airport's existing stormwater management system to accommodate the project and any potential increased amount of runoff after construction is complete. Given the use of project-specific erosion control and pollution prevention measures it

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[107] ACAA, 2021. *Preliminary Geotechnical Exploration Report for the Runway 28 Safety Area Improvement Project AGC, Pennsylvania*.

is expected that water quality standards would not be exceeded. Therefore, the Proposed Project is not expected to exceed thresholds indicating a significant impact.

Groundwater and Public Water Supply. FAA Order 1050.1F states that groundwater impacts are significant if the proposed action would: 1) exceed groundwater quality standards established by Federal, state, local, and tribal regulatory agencies, or 2) contaminate an aquifer used for public water supply such that public health may be adversely affected.

Although the compaction of fill and establishment of compacted slopes over existing elevations may alter surface water contribution and thus the volume and direction of flow of superficial or perched groundwater, it is not expected that the Proposed Project will substantively impact groundwater. The Proposed Project will not impact public water supply. Therefore, the Proposed Project is not expected to exceed thresholds indicating a significant impact for these resources.

Best Management Practices. The Proposed Project would include the implementation of best management practices per Pennsylvania DEP permits to minimize erosion and sedimentation and maintain water quality throughout the construction and operational phases. Collectively, erosion control measures and pollution prevention plans would be expected to preclude substantial water quality impacts and any significant potential for the Proposed Project to exceed applicable water quality standards.

Construction best management practices would be designed to minimize erosion and sedimentation and prevent spills. Selection of erosion control best management practices is based on the intent to minimize disturbed areas, stabilize disturbed areas, and protect water quality. Selection of sediment control best management practices is based on the intent to retain sediment onsite and control the site perimeter. Specific measures and practices that may be implemented include:

- *Stormwater Pollution Prevention Plan* – identifies equipment storage, cleaning and maintenance areas/activities; points of ingress and egress to the construction site; material loading, unloading, and storage practices and areas, including locations for construction materials, building materials, and waste materials; and materials, equipment, or vehicles that may come in contact with storm water.
- *Construction Sequencing and Erosion Control Measures* – Construction sequencing and phasing would be specified in individual project plans and specifications. Construction sequencing is an effective method to minimize erosion by reducing the amount of exposed land at any one time. In addition to construction sequencing, erosion control measures further reduce the potential to exceed water quality standards. These measures consist of reducing erosive effects of rain on exposed soils through the use of temporary and permanent soil stabilization measures, stabilizing slopes, and re-establishing vegetation to stabilize disturbed areas and reduce stormwater flow velocities. Common erosion control measures that may be used during construction include mulching, sodding, and/or seeding to stabilize exposed soils and establish ground cover.
- *Structural Controls to Minimize Sediment Transport* – The use of structural controls during construction to minimize erosion and sediment transport would be further detailed in individual project plans and specifications. Structural controls may include, but not necessarily be limited to staked hay bales, silt fences, and floating baffles in adjacent water bodies.

- *Pollution Prevention and Control* – Pollution prevention and waste management plans provide an effective means to address the storage, handling, and disposal of fuels, lubricants, and other materials used during construction (see Section 3.5). This may include, but not be limited to, implementing a construction-phase Stormwater Pollution Prevention Plan, Solid Waste Management Plan, and spill prevention and response plans documenting the measures that will be taken to prevent accidental releases to the environment and, should they occur, the actions that will be undertaken to minimize the environmental impact. In addition, the contractor would be required to comply with Federal, state, and local hazardous materials/waste management regulations to assure proper management of hazardous and other special waste streams for the Proposed Project.

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CHAPTER 4

Agency Coordination and Public Involvement

4.1 Early Project Involvement

4.1.1 Public Involvement

An early project announcement fact sheet describing the purpose and need for RSA improvements and the intent to evaluate alternatives to improve the RSA was placed on the ACAA website in May 2021 (**Appendix I**).

4.1.2 Agency and Tribal Involvement

Early coordination letters describing the purpose and need for RSA improvements and the intent to evaluate alternatives to improve the RSA were sent to potentially interested resource agencies, tribes, and other stakeholders in July – November 2021(**Appendix I**). Recommendations were received from USEPA, the U.S. Natural Resource Conservation Service, and Pennsylvania DCNR and incorporated into the analysis given in Chapter 3.

4.2 Availability of the Draft EA

4.2.1 Notification and Publication of Draft EA

A Notice of Availability of the Draft EA and Notice of Public Hearing was published in the *Pittsburgh Post-Gazette* and *Pittsburgh Courie*r newspapers on February 27, 2022 and March 2, 2022, respectively (**Appendix I**). The Notice and a PDF of the Draft EA have also been placed on the AGC website and are available for download at: https://flypittsburgh.com/allegheny-county-airport/runway-safety-area-improvements-at-allegheny-county-airport-agc/. Hardcopies of the Draft EA are available for public review at the airport by appointment only, which can be scheduled by calling (412) 466-3026.

4.2.2 Commenting on the Draft EA

The Draft EA will be available for review by the public, government agencies, and interested parties from February 27, 2022 through April 4, 2022. The Study Team will consider all comments received during the Draft EA public comment period.

A virtual Public Workshop will be held on March 29, 2022 from 6:00 p.m. to 7:00 p.m., followed by a virtual Public Hearing beginning at 7:00 p.m. (**Appendix I**). During the virtual Public Workshop, representatives of the Airport and the Study Team will provide a brief presentation on the Proposed Project and its environmental impacts and will answer questions from the Workshop participants. Register for the Public Workshop and Public Hearing by visiting http://bit.ly/AGCDraftEA or for those without internet access, call into the meeting at (877) 853-5247; the Webinar ID is 869 3860 4895.

All verbal comments given at the Hearing will recorded, transcribed, and included in the Final EA. Comments will be accepted during the Hearing and for an additional six days thereafter.

4.3 Final EA

The FAA will review the EA to determine its adequacy under NEPA, CEQ regulations implementing NEPA (40 CFR Part 1500), and FAA Orders 1050.1F and 5050.4B. Based on the analysis in the Final EA, the FAA will decide whether to either issue a Finding of No Significant Impact (FONSI), a FONSI with Record of Decision, or prepare an Environmental Impact Statement.

CHAPTER 5

List of Preparers and Contractor Disclosure Statements

Name	Title	Project Responsibility	Education	Years' Experience
GAI				
Jack Thompson, Jr., CM, LEED AP	President	Project Technical Advisor	AS, Civil Engineering Technology, AA, General Education	35
Matthew Sickles, P.E.	Director	Project Director	B.S. Civil Engineering	32
Daniel DePra, P.E., BCEE, PMP	Technical Operations – Project Systems Leader	Project Manager	B.S. Mechanical Engineering; B.S. Chemistry; M.S. Civil Engineering; MBA	28
Ben Resnick, RPA 10135	Group Manager, Cultural Resources	Cultural Resources	M.A. Anthropology; M.B.A; B.A. Anthropology	41
Don Splitstone, P.E.	Geotechnical Engineering Manager	Geotechnical Survey	B.S. Engineering Physics, B.S. Civil and Environmental Engineering	25
Todd Wilson., P.E	Assistant Engineering Manager	Transportation Study	M.B.A; BS Civil Engineering	15
Environmental Science Associates				
Mike Arnold, LEED AP	Senior Vice President / Airports Director	Project Director Project approach and QA/QC	B.S. Civil Engineering.	31
Amy Paulson	Principal Associate / Senior Planner	Project Manager Project approach, impact evaluations, technical writing, and QA/QC	M.S. Conservation Biology and Sustainable Development, B.S. Ecology	24
Chris Jones, AICP	Principal Associate / Aviation Specialist	Impact evaluations, technical writing, and QA/QC	J.D. Law; B.A. Sociology	17
Patrick Hickman, PLA, AICP, LEED AP	Managing Associate / Planner	Impact evaluations, technical writing	M.S. Urban and Regional Planning, B.S. Landscape Architecture.	12
Sean Burlingame	Managing Associate / Air Quality and Acoustics Analyst	GIS Analysis	B.S. Aviation Management	15
Jessica O'Dell	Associate Planner / Socioeconomic Analyst	Impact evaluations, technical writing	B.S. Environmental Science; B.A. International Relations	4
Alexandra Thompson	Associate Planner / Socioeconomic SME	QA/QC	M.A. Urban Planning, B.A. Peace and Conflict Studies	12

Name	Title	Project Responsibility	Education	Years' Experience
Steven Goetzinger	Managing Associate / Airport Noise SME	Impact evaluations and technical writing	B.S. Chemistry, M.S. Air Quality	15
James Songco	Senior Graphic Designer, Project Technician	Graphics and design	A.A. Fine and Studio Art, B.F.A. Graphic Design	22
Gary Gick	Senior Publications Specialist	QA/QC and final document production		30
Autumn Ward, CM, ENV SP	Principal Associate; Aviation Specialist and NEPA Outreach SME	Public Engagement	M.S. Aeronautics, B.S. Aviation Business Administration	17
Collective Efforts				
Coreen Casadei	Principal	Project Manager QA/QC	BS Civil Engineering, BS Physics	34
Rachael Galloway	Environmental Scientist	GIS Analysis, field team, technical writing	BS Geography: Environmental Studies and Sustainability,	3
Dominic Costantini	Environmental Scientist	Field team, technical writing	BS Environmental Studies	2
Brianna Shea	Environmental Scientist	Field team, technical support	BS Environmental Science	2

Appendix A

Master Plan Alternatives (2017)

Figure 1: Constraints Map

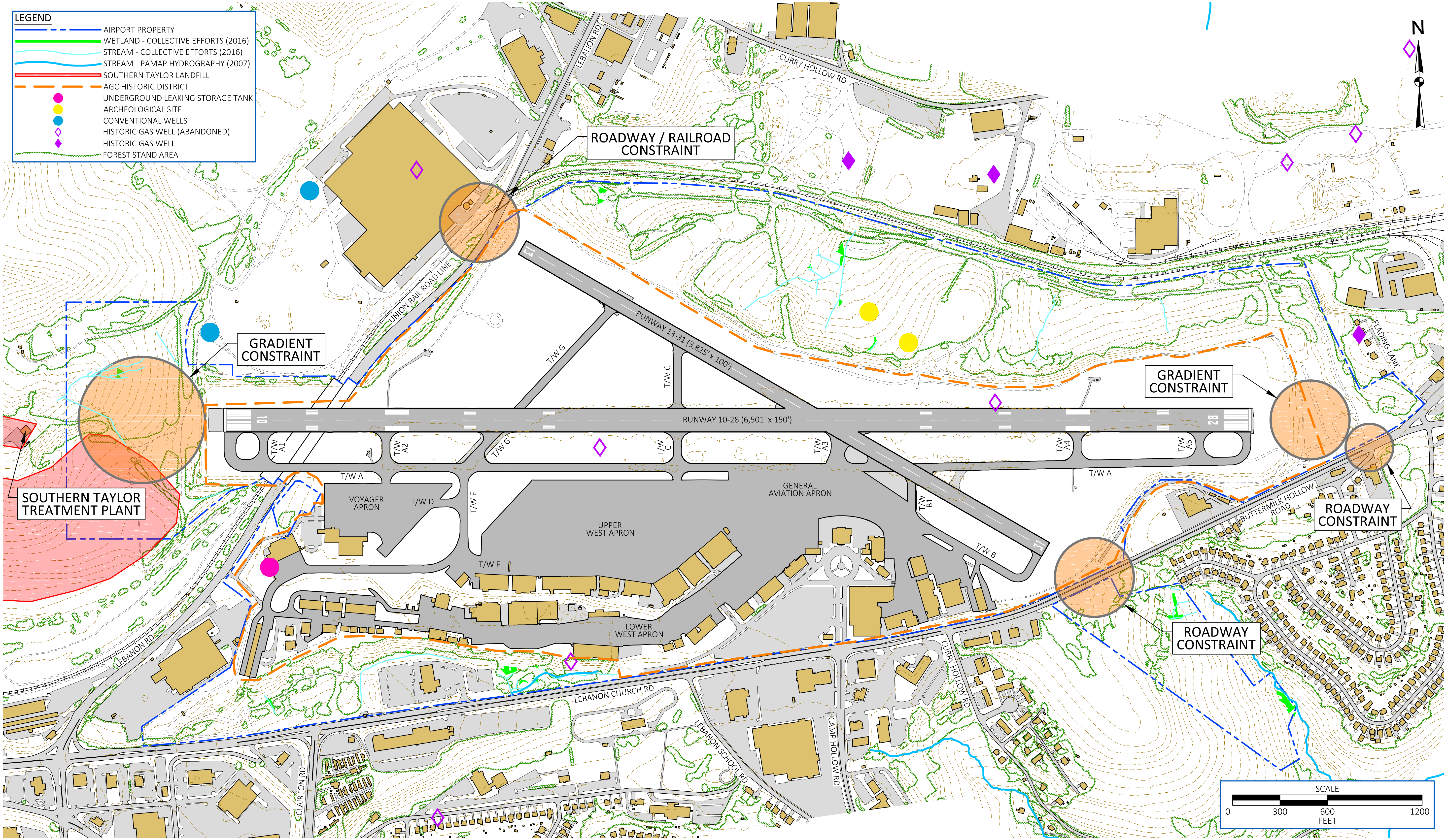


Figure 2: Runway 10-28 No Build

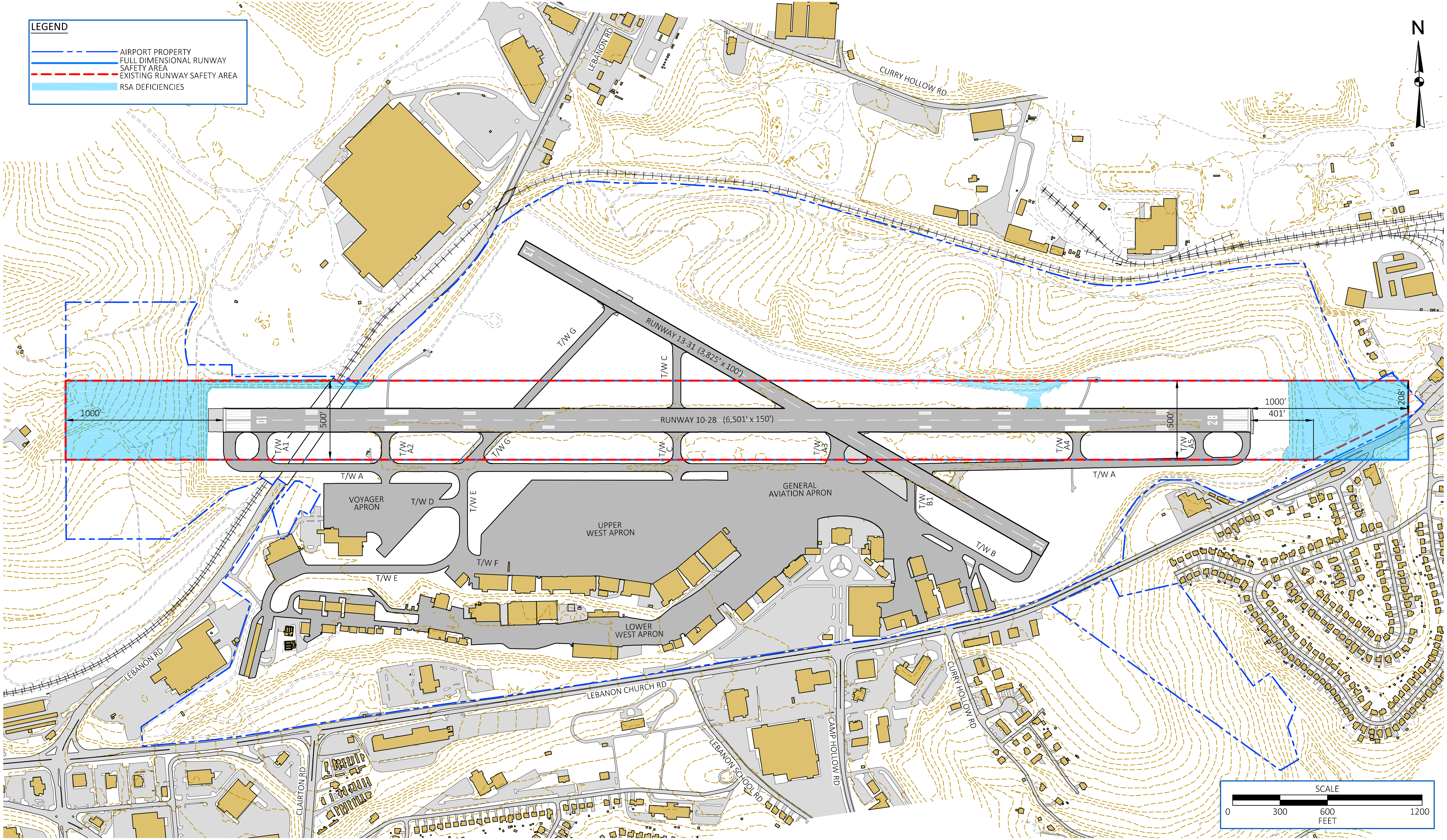


Figure 3: Runway 13-31 No Build

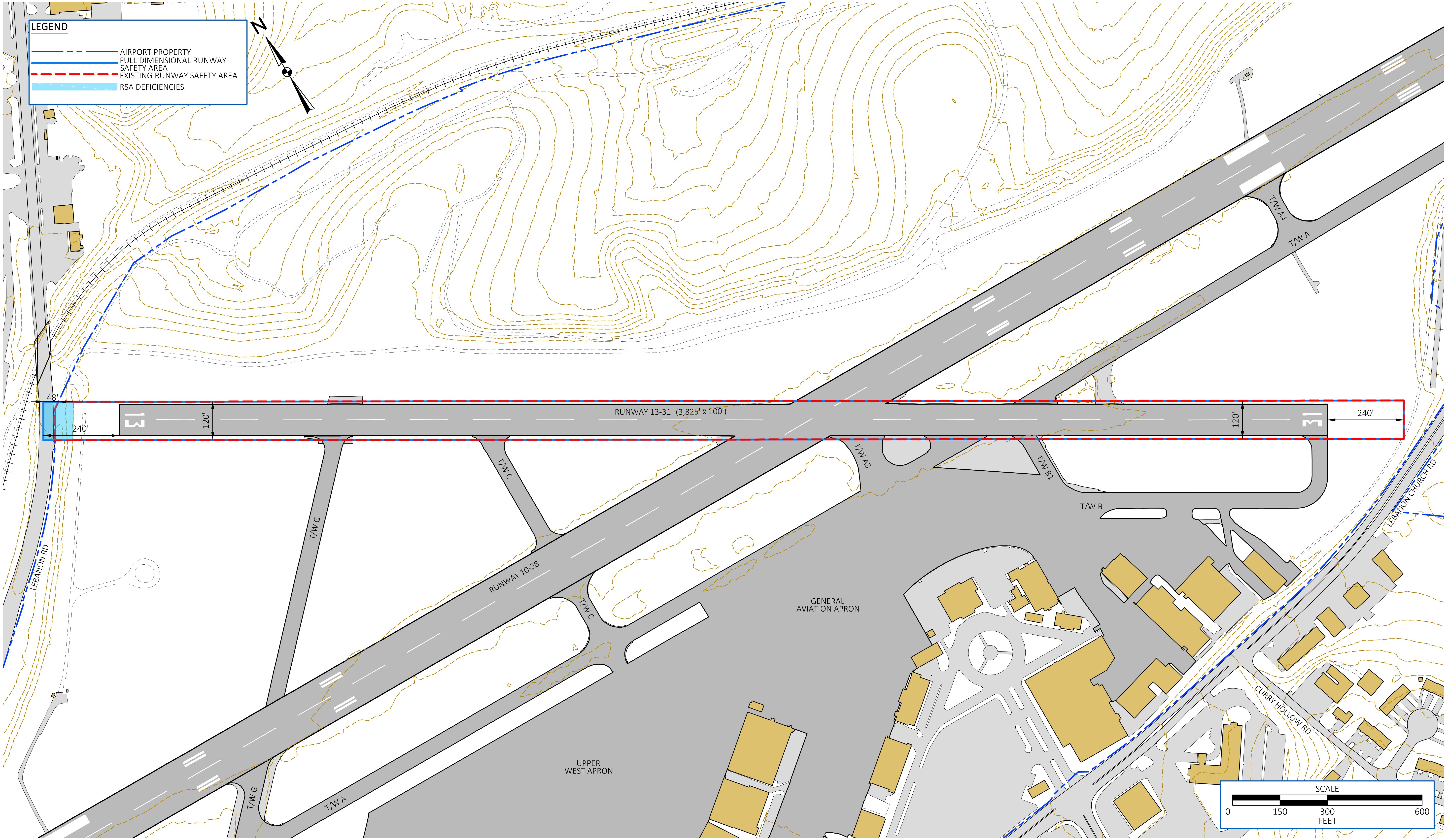
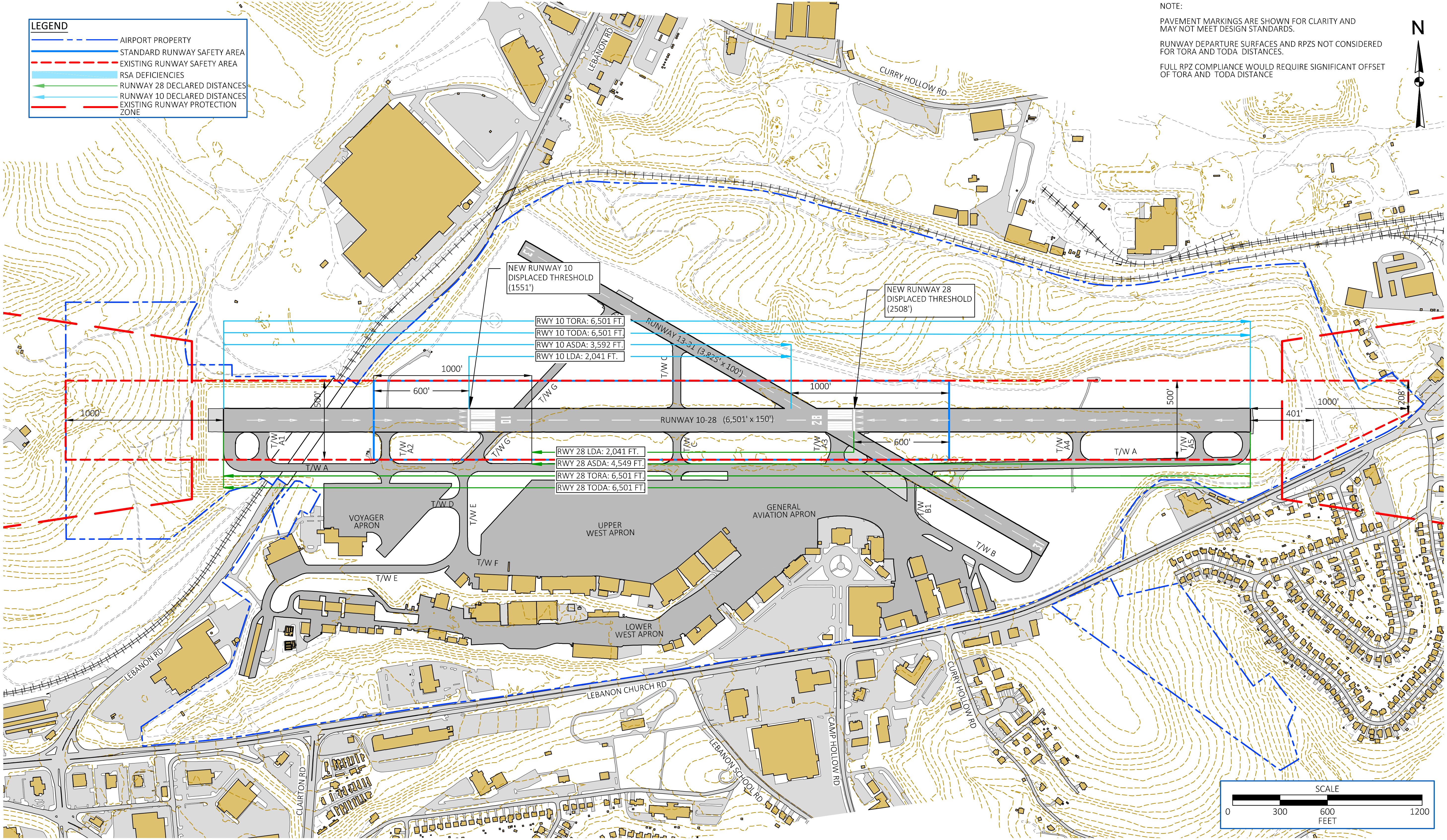


Figure 4: Runway 10-28 No Build - Full Standard RSA Declared Distances



NOTE:

PAVEMENT MARKINGS ARE SHOWN FOR CLARITY AND MAY NOT MEET DESIGN STANDARDS.

RUNWAY DEPARTURE SURFACES AND RPZS NOT CONSIDERED FOR TORA AND TODA DISTANCES.

FULL RPZ COMPLIANCE WOULD REQUIRE SIGNIFICANT OFFSET OF TORA AND TODA DISTANCE

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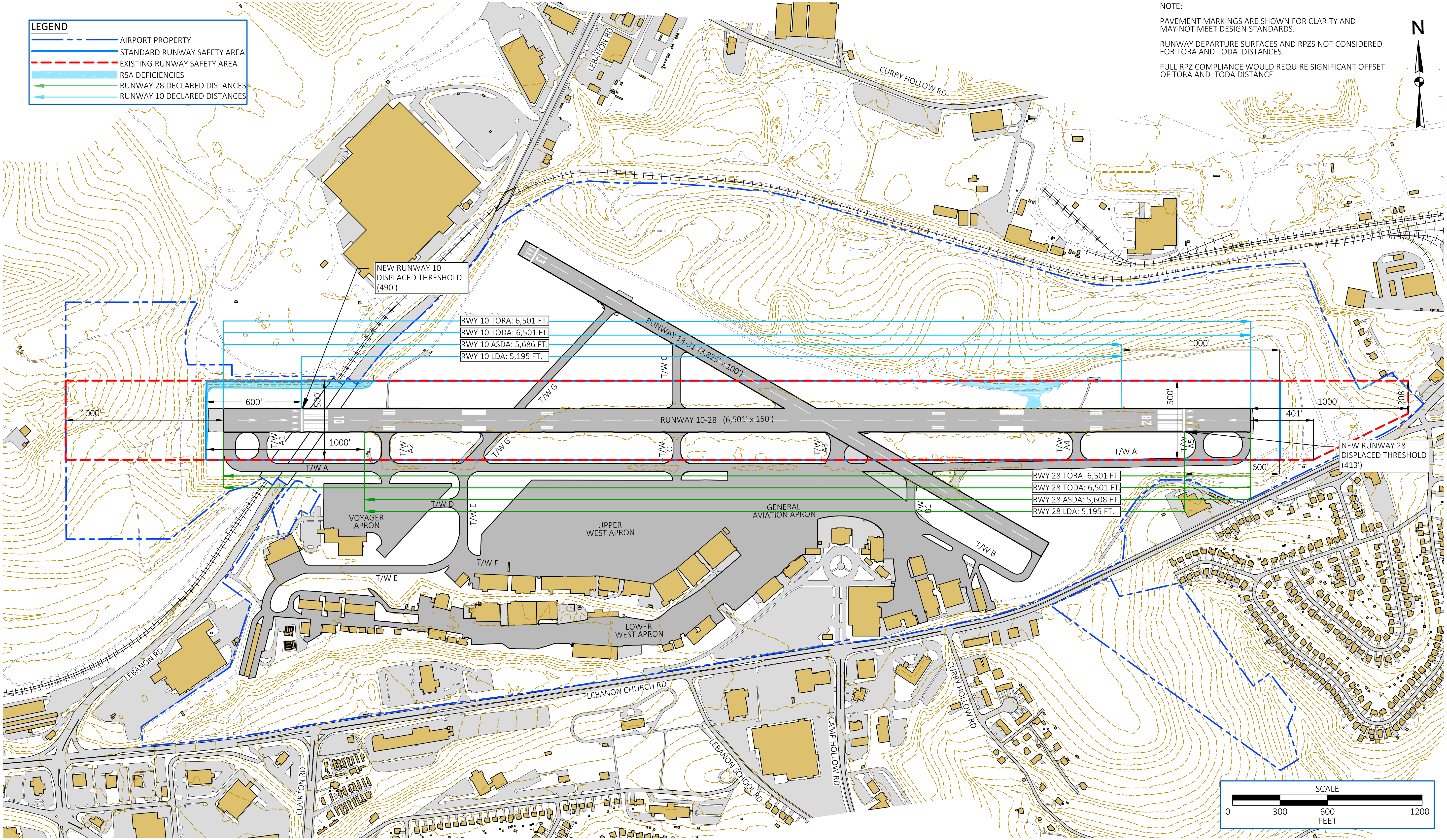
Figure 5: Runway 10-28 No Build - Partial Standard RSA Declared Distances



LEGEND
- AIRPORT PROPERTY
- STANDARD RUNWAY SAFETY AREA
- EXISTING RUNWAY SAFETY AREA
- RSA DEFICIENCIES
- RUNWAY 28 DECLARED DISTANCES
- RUNWAY 10 DECLARED DISTANCES

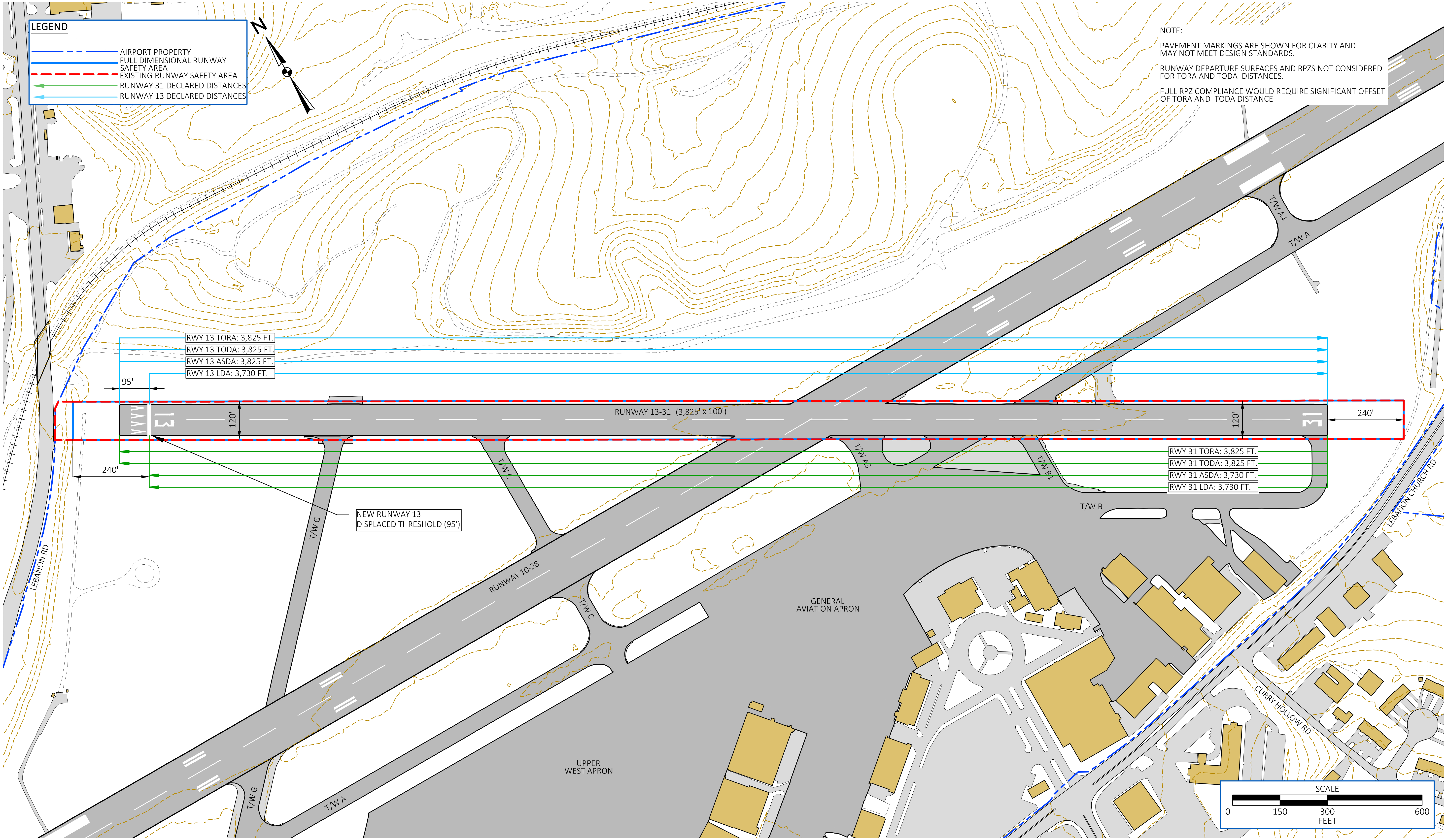
NOTE:

PAVEMENT MARKINGS ARE SHOWN FOR CLARITY AND MAY NOT MEET DESIGN STANDARDS.

RUNWAY DEPARTURE SURFACES AND RPZS NOT CONSIDERED FOR TORA AND TODA DISTANCES.

FULL RPZ COMPLIANCE WOULD REQUIRE SIGNIFICANT OFFSET OF TORA AND TODA DISTANCE

Figure 6: Runway 13-31 No Build - Declared Distances



NOTE:

PAVEMENT MARKINGS ARE SHOWN FOR CLARITY AND MAY NOT MEET DESIGN STANDARDS.

RUNWAY DEPARTURE SURFACES AND RPZS NOT CONSIDERED FOR TORA AND TODA DISTANCES.

FULL RPZ COMPLIANCE WOULD REQUIRE SIGNIFICANT OFFSET OF TORA AND TODA DISTANCE

Figure 7: Runway 28 Maximum RSA

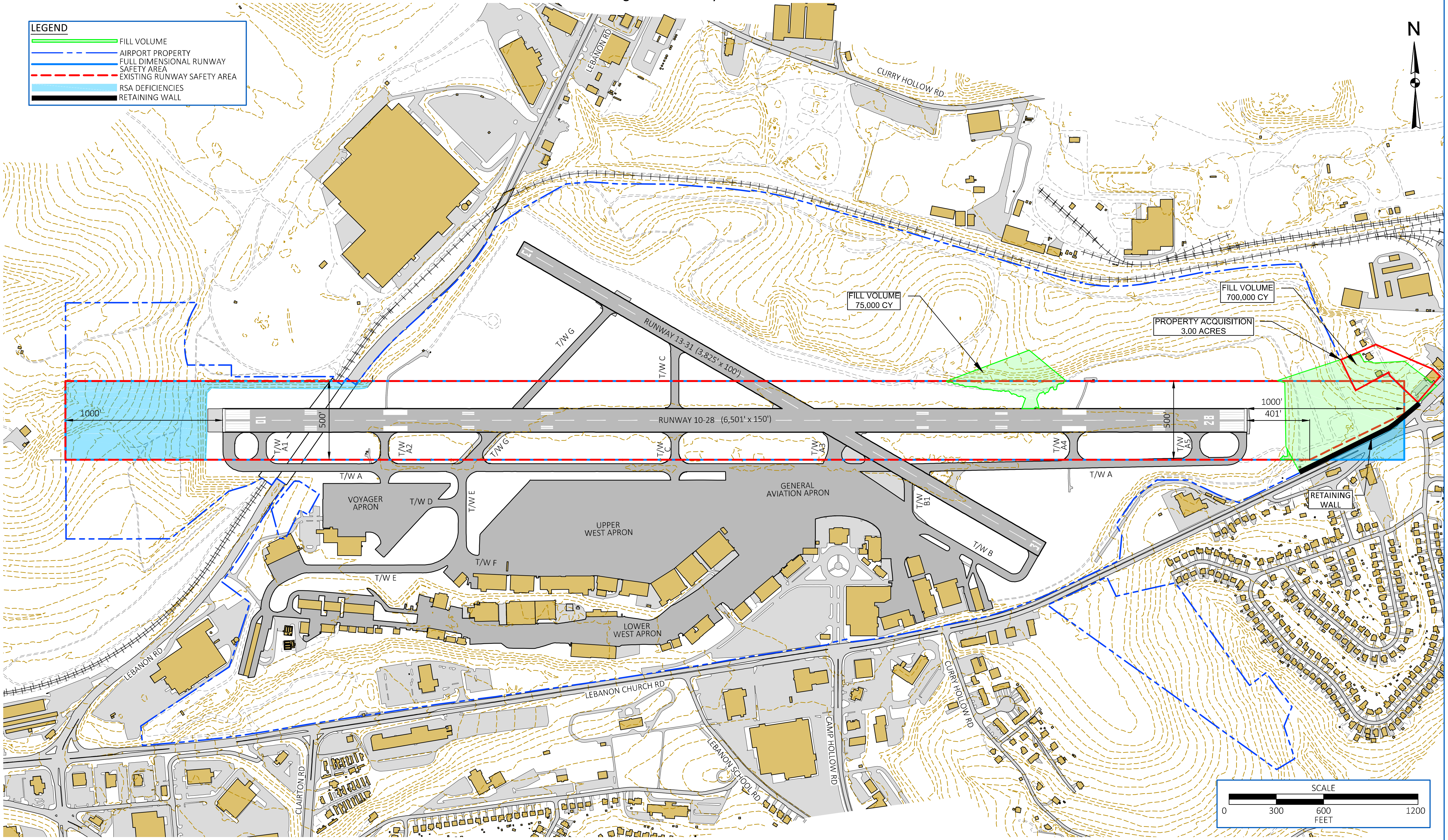


Figure 8: Maximize RSA without Land Acquisition

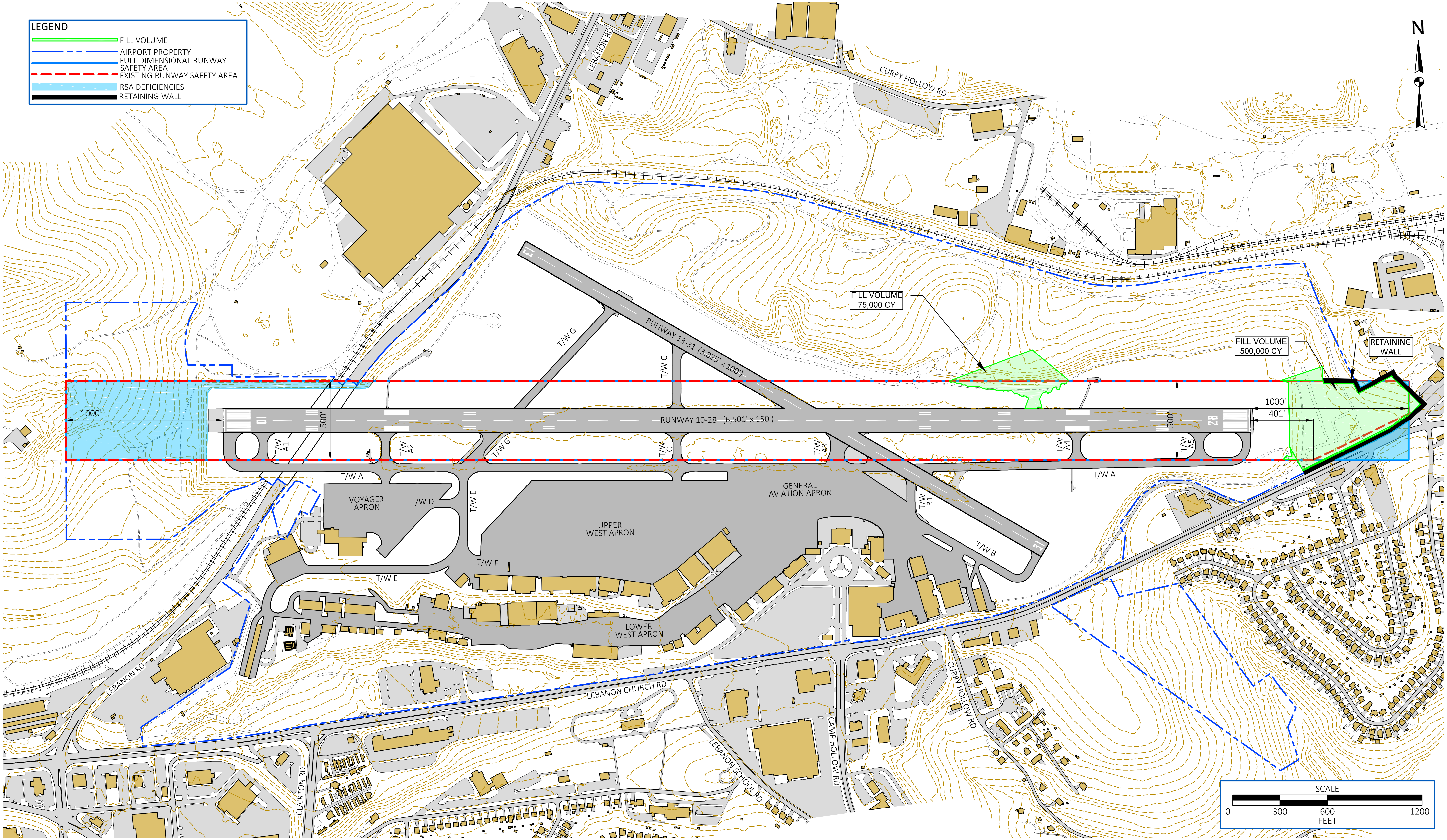


Figure 9: Runway 28 EMAS

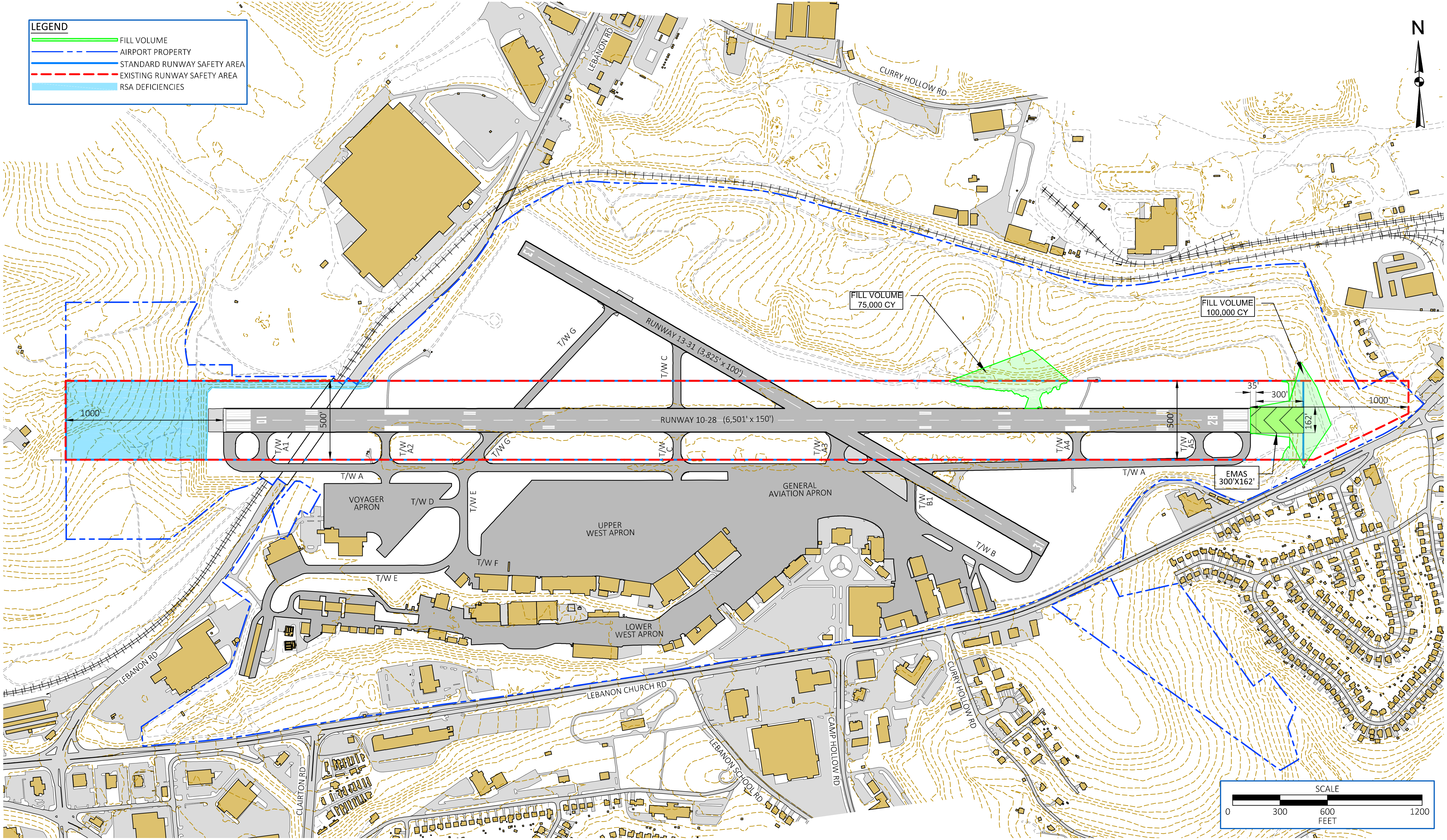


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Figure 10: Runway 10 Maximum RSA

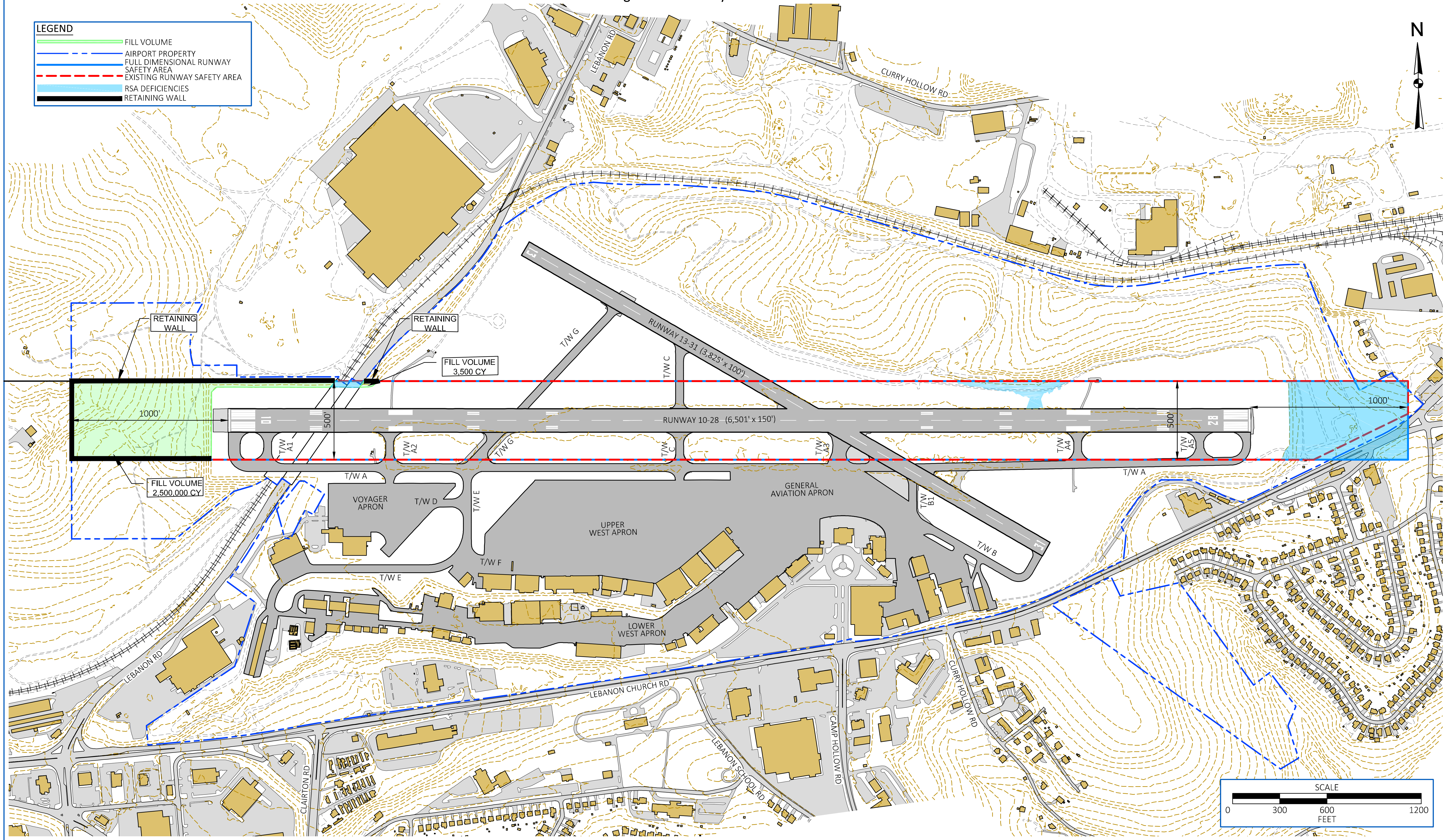

Figure 11: Runway 10 EMAS

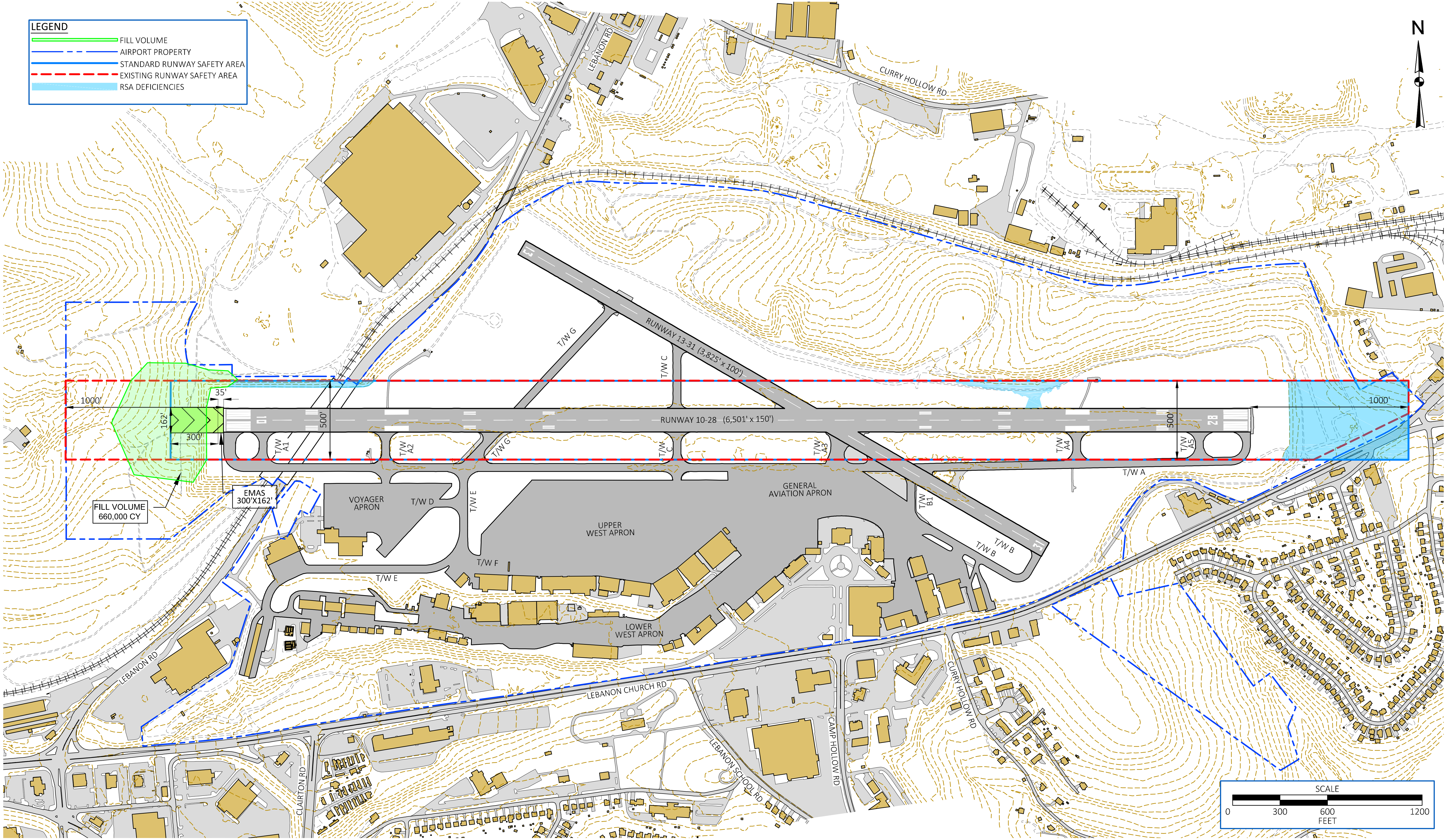

Figure 12: Runway 10 EMAS with Retaining Wall

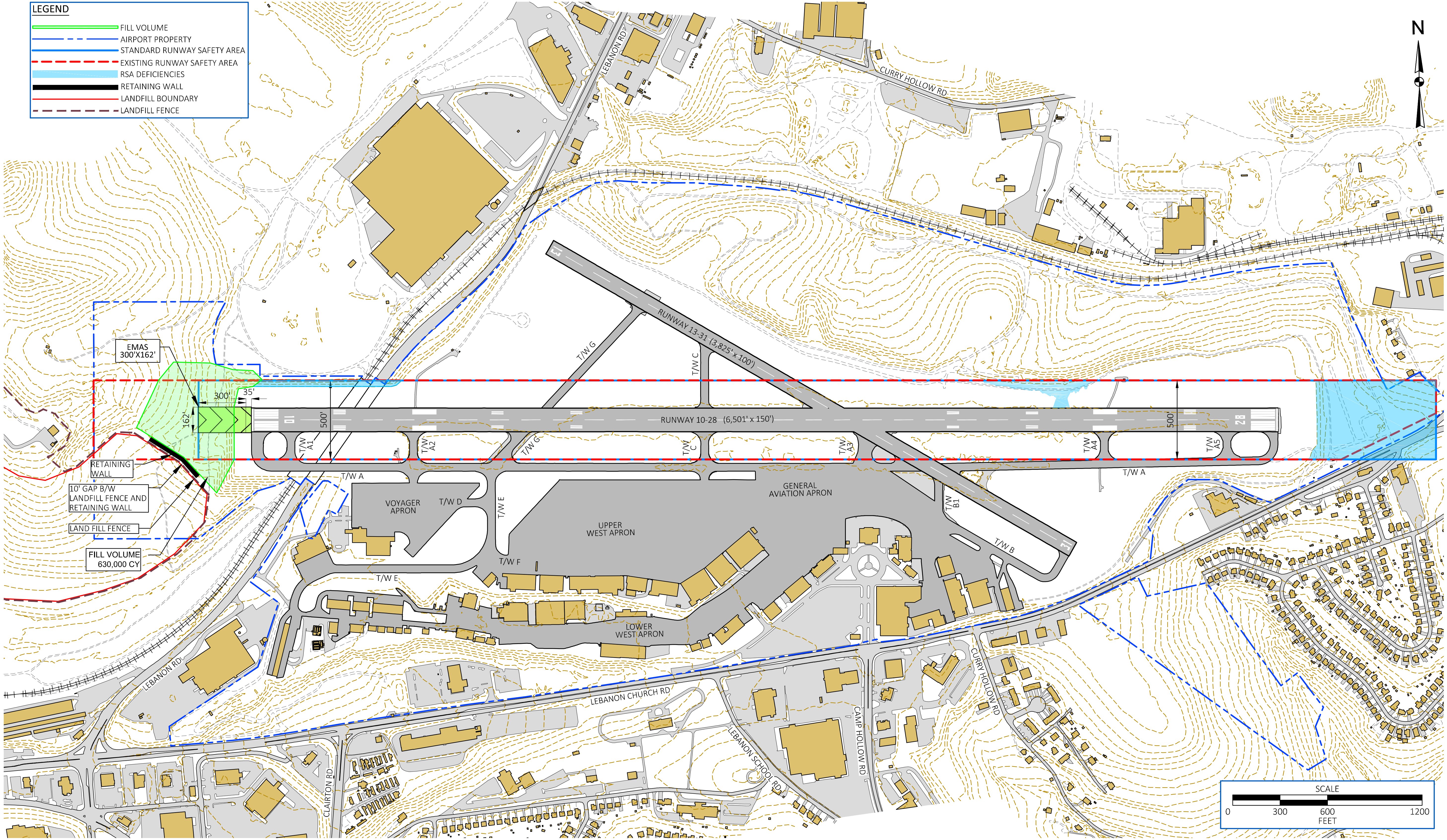

Figure 13: Runway 13-31 Length Reduction

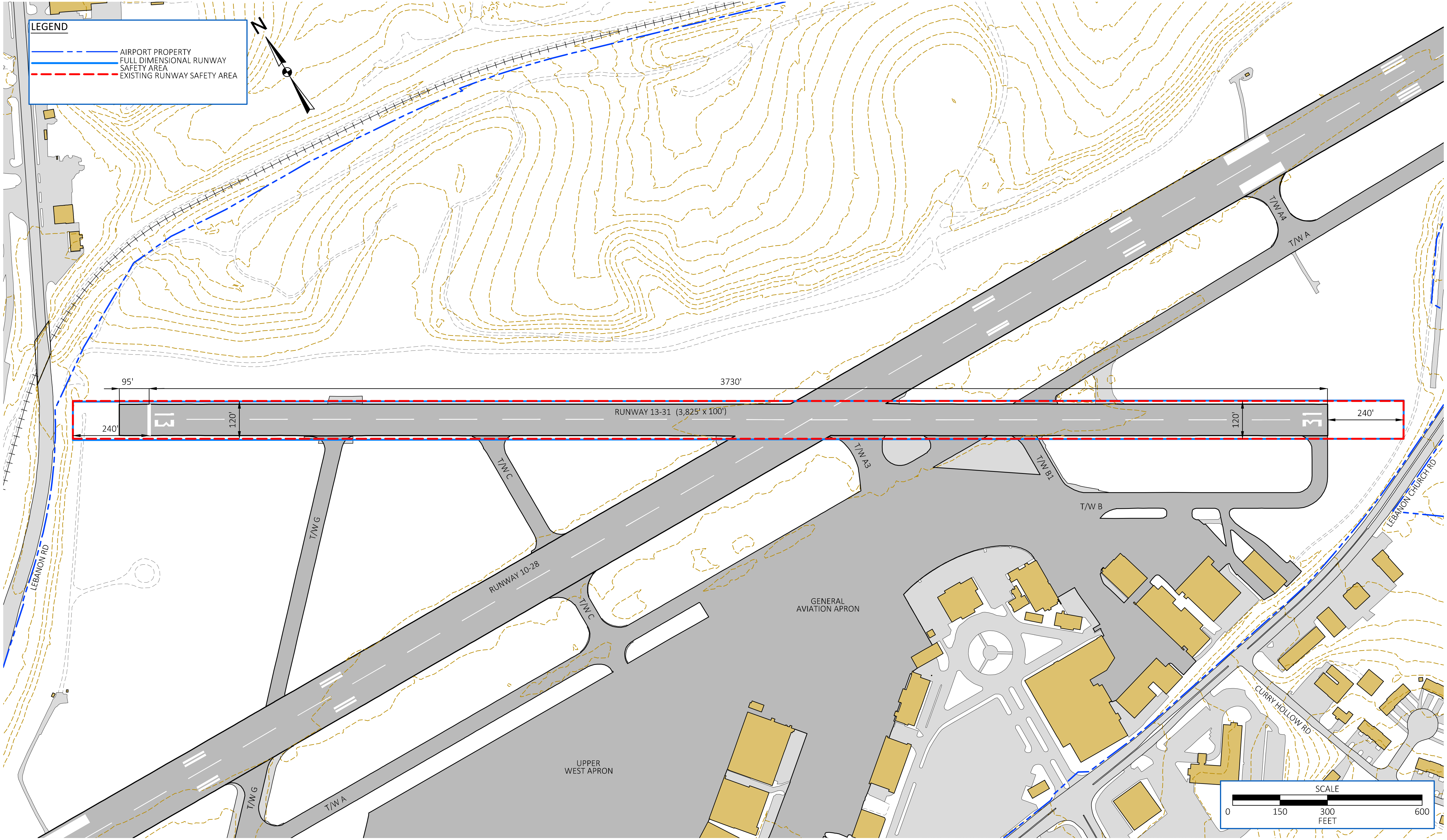

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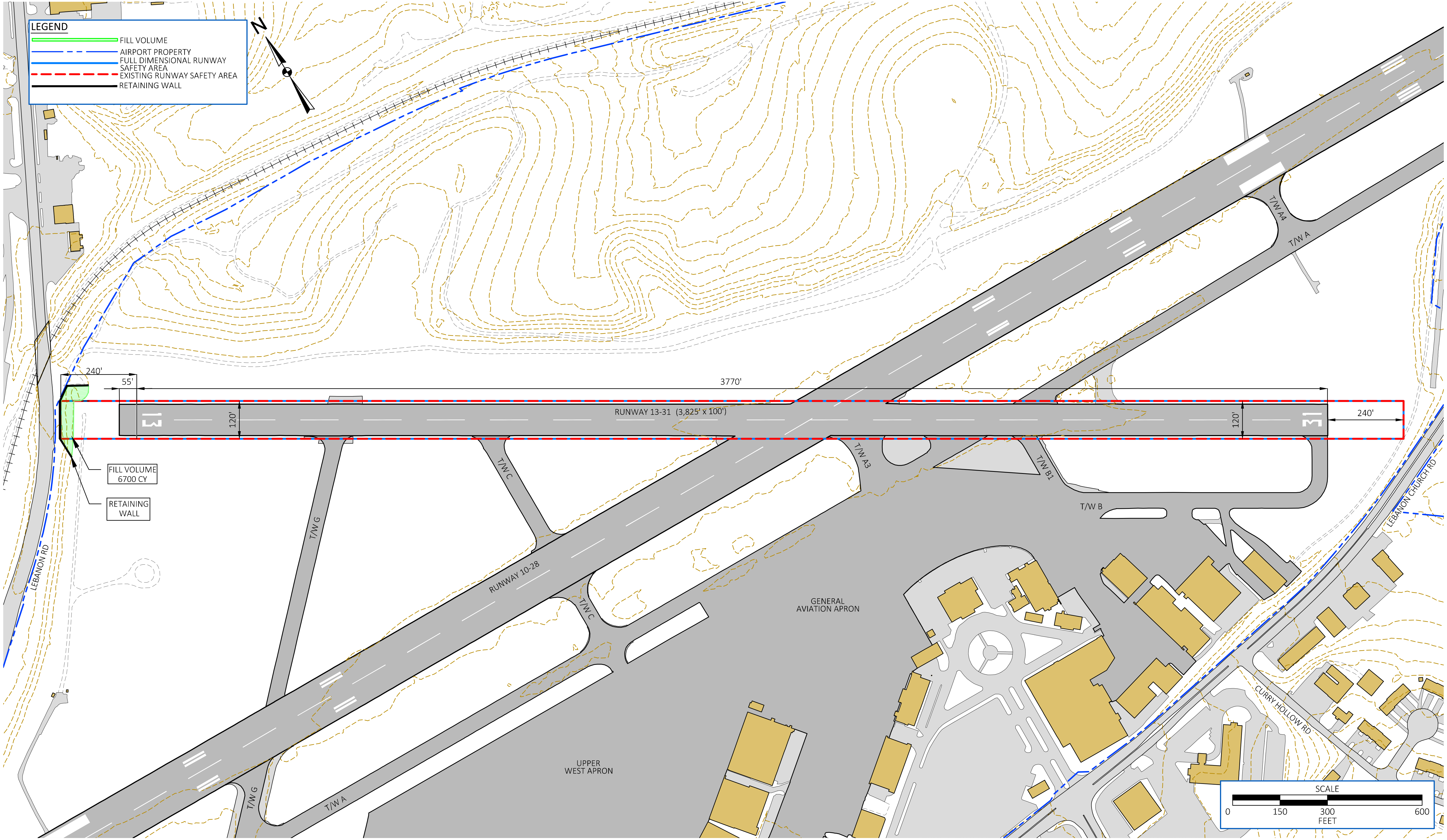
Figure 14: Runway 13-31 Length Reduction and Fill



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Appendix B

Construction Air Quality Modeling Technical Report

APPENDIX B

Construction Air Quality Modeling Technical Report

B.1 Introduction and Overview

This report describes the air quality and climate modeling input parameters to support the Environmental Assessment (EA) at Allegheny County Airport (AGC or the Airport). As owner and operator of the Airport, the Allegheny County Airport Authority proposes a number of improvements to the Runway 10-28 Safety Area (RSA) to allow it to meet standards and safety requirements in accordance with FAA Order 5200.8.

B.2 Methodology

Emissions modeling was performed for carbon dioxide (CO_2), methane (CH_4), nitrogen dioxide (N_2O), and the six criteria air pollutants for the construction activities projected to take place as part of the Proposed Project. Construction emissions associated with the Proposed Project were calculated using the Airport Construction Emissions Inventory Tool (ACEIT),[1] which contains construction emission factors from existing Environmental Protection Agency (USEPA) regulatory models, such as the Motor Vehicle Emissions Simulator (MOVES, revised January 2013), NONROAD (July 2009), as well as emission factors for fugitive emissions from EPA's Compilation of Air Pollution Emission Factors (AP-42). ACIT was released with the Transportation Research Board's *Airport Cooperative Research Program Report 102, Guidance for Estimating Airport Construction Emission*s.

Through the user specification of high-level inputs such as project cost and project site weather, the ACEIT uses a series of assumptions to generate lists of emissions sources (such as construction equipment and employee on-road automobiles) and associated usage factors in order to calculate a construction emissions inventory.

B.3 Model Inputs

The Proposed Project includes multiple projects that require construction activity. The Proposed Project description, which is summarized in Section 1.3.1, was reviewed for potential air quality emissions and separated into distinct ACEIT project types. A number of projects listed in Section 1.3.1 are not listed here as they are already included within the ACEIT project types or they were seen as not being associated with any air quality emissions. For example, the clearing of trees and

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[1] This tool was released with the 2016 TRB ACRP, *Guidance for Estimating Airport Construction Emissions*. ACRP Report 102. Available at: https://doi.org/10.17226/22437.

vegetation is already included within RSA project type as “Clearing and Grubbing” subcategory. The construction projects as categorized for input into ACEIT are listed below with the ACEIT category type given in parentheses:

- Runway 10 RSA Expansion (Runway Safety Area)
- Runway 28 RSA Expansion (Runway Safety Area)
- Expand mid-Runway RSA (Runway Safety Area)
- Remove Existing Airport Service Road (Demolition)
- Establish New Airport Service Road (Access Road)
- Relocate FAA Sheds (Convenience Store- 1200 square feet – 1 story)
- Relocate Instrument Landing System, Approach Light System, and Localizer Array (NAVAIDS)

Project weather information loaded into ACEIT used the 2020 NCDC weather station normals from the National Climate Data Center weather station at the Airport. To provide the most conservative estimate of air emissions, the Proposed Project construction was modeled to last one year and will therefore include both seasons modeled by ACEIT. Within the ACEIT model, April to September are considered “summer” months and October to November are considered “winter” months. The average annual temperature at AGC was 66.1 degrees Fahrenheit (°F) in summer and 38.6°F in winter. Each project is assumed to occur equally spread between the winter and summer months except for Clearing and Grubbing tasks, which are expected to only occur during the winter months.

ACEIT automatically reduces construction vehicle emission factors over time, under the assumption that construction equipment emissions control technology will continue to advance; however, to reduce the likelihood of underestimating construction emissions levels, all construction activity was modeled using 2023 emission factors. Construction projects were assumed to occur in the same calendar year (2023).

ACEIT uses a small number of inputs to estimate emissions for construction projects, and the number of required inputs varies by project type. The construction projects in the AGC emissions inventory required up to three inputs each including the estimated cost of the project. These inputs were developed based on information provided by the Airport about the Proposed Project and are summarized in **Table B-1**.

TABLE B-1
LIST OF AGC PROPOSED ACTION CONSTRUCTION PROJECTS AND ACEIT MODELING PARAMETERS

Project Name	Type of ACEIT Project	Estimated Cost (Millions of $)	Maximum Length	Maximum Width
Runway 10 RSA Expansion	Runway Safety Area	18.608	635	650
Runway 28 RSA Expansion	Runway Safety Area	8.266	7,100	100
Expand mid-Runway RSA	Runway Safety Area	2.151	NA	NA
Remove Existing Airport Service Road	Access Road	0.077	4400	10
Establish Existing Airport Service Road	Access Road	0.232	1780	10
Relocate FAA Sheds	Convenience Store-1200 square feet- 1 story	0.083	NA	NA
Relocate Instrument Landing System, Approach Light System, and Localizer Array	NAVAIDS	0.917	700	300

SOURCE: Environmental Science Associates, 2021.

For each of the projects, ACEIT calculates default usage values for each of the projects but the default settings can be updated in some cases if more project-specific information is available. Where possible, the default ACEIT assumptions were updated to match the available project-specific information available. For each project listed below, the non-default inputs are summarized for each ACEIT project.

- Runway 10 RSA Expansion (Runway Safety Area)
  - The amount of fill used was updated to 450,000 cubic yards
  - The acres needing to be cleared was updated to 36 acres
- Runway 28 RSA Expansion (Runway Safety Area)
  - The amount of fill used was updated to 55,000 cubic yards.
  - The acres needing to be cleared was updated to 48 acres
- Expand mid-Runway RSA (Runway Safety Area)

  - The amount of fill used was updated to 55,000 cubic yards.

- Remove Existing Airport Service Road (Demolition)
  - Only Excavation (Top Soil Stripping) as these areas are in the RSA fill area
  - Cost was calculated from *New Roads/Fence/Utilities/Stormwater Management/Erosion and Sediment Control* category with 75% going to each RSA budget and 25% going to the Roads. Then, 25% of that new amount went to removing the old roads.
- Establish New Airport Service Road (Access Road)
  - Cost was calculated from *New Roads/Fence/Utilities/Stormwater Management/Erosion and Sediment Control* category with 75% going to each RSA budget and 25% going to the Roads. Then, 75% of that new amount went to the addition of new roads.
- Relocate FAA Sheds (Convenience Store- 1200 square feet – 1 story)
- Relocate Instrument Landing System, Approach Light System, and Localizer Array (NAVAIDS)
  - Assumes 1 Instrument Landing System, 1 Localizer, and 20 Lights
  - Cost for moving the NAVAIDS and sheds ($1,000,000) was given together so the cost to move 1 item is assumed to be equal. Therefore, 91.7% of the cost went to moving the NAVAIDS (22 of 24) and 8.3% of the cost went to moving the sheds

B.4 Model Results

Estimated construction-related criteria pollutant emissions associated with the Proposed Project are shown in **Table 1**.

TABLE 1
ESTIMATED EMISSIONS FROM CONSTRUCTION ELEMENTS

Project Element	Emissions (short tons/year)					
	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Runway 10 RSA	17.42	2.28	16.00	0.12	0.70	0.40
Runway 28 RSA	11.76	0.99	12.24	0.10	0.53	0.24
Midrunway RSA	7.50	0.69	7.86	0.06	0.26	0.15
Access Road Removal	1.20	0.05	0.07	0.00	0.06	0.01
Access Road Addition	1.07	0.07	0.07	0.00	0.03	0.01
NAVAIDS	1.89	0.08	0.13	0.00	0.01	0.01
Shed Relocation	0.09	0.02	0.06	0.00	0.06	0.00
Proposed Project Maximum Annual Emissions	40.93	4.17	36.42	0.29	1.64	0.81

Project Element	Emissions (short tons/year)					
	CO	VOC	NO_x	SO_2	PM_{10}	$PM_{2.5}$
***De Minimis* Thresholds**	none	50	100	100	none	100
***De Minimis* Threshold Exceeded**	NA	No	No	No	NA	No

NOTE: CO = carbon monoxide; N/A = Not Applicable; NO_X = nitrogen oxides; PM10 = particulate matter less than or equal to 10 microns in diameter; PM2.5 = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; VOC = volatile organic compound
Values may not total due to rounding
SOURCE: ACEIT, 2021; Environmental Science Associates, 2021.

B.4 Air Quality Analysis Conclusions

The Proposed Project emissions are all lower than the *de minimis* levels applicable to the Airport geographic area; therefore, a General Conformity Determination is not required.

The construction emissions associated with the Proposed would not cause or contribute to violations of the National Ambient Air Quality Standards for criteria pollutants throughout project construction or implementation even when considering the nonattainment and maintenance status of Allegheny County. Thus, the Proposed Project would not cause significant impacts to air quality in accordance with FAA Order 1050.1F.

B.5 Climate

FAA Order 1050.1F provides guidance on preparation of Greenhouse Gas (GHG) assessments for airport-related actions and projects. The GHG assessment for this EA includes direct and indirect emissions inventories for landside sources (area and mobile) associated with construction of the Proposed Project. GHG emissions inventories were prepared for construction of the Proposed Project. The GHG emissions analysis generally follows the same methodology, using the same air quality model as the air quality criteria pollutant emissions analysis discussed in the previous sections.

GHGs include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. Increasing the concentration of GHGs in the atmosphere affects global climate. Anthropogenic (i.e., man-made) sources of GHG emissions are generally associated with fossil fuel use. Mass emissions of GHGs are accounted for by converting emissions of specific pollutants to carbon dioxide equivalent (CO_2e) emissions by applying the global warming potential (GWP) value for each specific pollutant. GWP represents the amount of heat captured by a mass of a specific GHG compared to a similar mass of CO_2. These GWP ratios are provided by the Intergovernmental Panel on Climate Change (IPCC) in its Fifth Assessment Report (AR5).[2] By applying the GWP ratios, project-related CO_2e emissions

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[2] IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, p.87.

can be tabulated in short tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline.

B.5.1 Thresholds of Significance

The FAA has not established a significance threshold for climate and GHG emissions, nor has the FAA identified factors for consideration in making a significance determination for GHG emissions. The CEQ has noted that "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand."[3]

B.5.2 Methodology

For purposes of the Proposed Project, increased GHG emissions would be associated with project construction. Consistent with the guidance provided in the FAA's 1050.1F Desk Reference and the CEQ's Draft National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions, 84 Fed. Reg. 30097 (June 26, 2019), emissions modeling was performed for CO_2, CH_4, and N_2O using ACEIT. The methodology for modeling was the same as that described in Section B.2 of this report.

The total emissions for CH_4 and N_2O were converted to CO_2e and combined with total CO_2 emissions to produce total short tons of CO_2e reported in this table. GWP values for CH_4 and N_2O were applied to calculate CO_2e and combined with total CO_2 emissions to produce total short tons of CO_2e. The resulting estimates are provided in **Table 2**.

B.5.3 No Action Alternative

As there would be no project under the No Action Alternative, an increase in GHGs would not be anticipated.

B.5.4 Proposed Project

Under the Proposed Project GHG emissions would result from fuel burn associated with project construction only. As shown in Table 2, project construction would produce approximately 36,678.43 metric tons or 40,431.04 short tons of CO_2e.

TABLE 2
ESTIMATED GHG EMISSIONS FROM CONSTRUCTION ELEMENTS

Project Element	Emissions (metric tons/year)					
	CO_2	CH_4	CH_4 CO_2e	N_2O	N_2O CO_2e	Total CO_2e
Runway 10 RSA	15,934.36	0.69	17.31	0.58	172.28	16,123.95
Runway 28 RSA	12,064.08	0.67	16.71	0.58	171.71	12,252.50

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[3] Federal Aviation Administration, 1050.1F Desk Reference, https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref/ (Accessed February 17, 2022).

TABLE 2
ESTIMATED GHG EMISSIONS FROM CONSTRUCTION ELEMENTS

Project Element	Emissions (metric tons/year)					
	CO_2	CH_4	CH_4 CO_2e	N_2O	N_2O CO_2e	Total CO_2e
Midrunway RSA	7,806.11	0.42	10.40	0.36	106.50	7,923.01
Access Road Removal	82.44	0.00	0.12	0.00	0.33	82.89
Access Road Addition	95.97	0.01	0.17	0.00	0.25	96.39
NAVAIDS	142.43	0.01	0.27	0.00	0.26	142.97
Shed Relocation	56.68	0.00	0.01	0.00	0.04	56.72
Proposed Project Total GHG Emissions (Metric Tons)	36,182.07	1.80	45.00	1.51	451.36	**36,678.43**
Proposed Project Total GHG Emissions (Short Tons)	39,883.89	1.98	49.60	1.67	497.54	**40,431.04**

NOTES:

CO_2 = carbon dioxide; CH_4 = Methane; N_2O = nitrogen dioxide

For purposes of calculating GHG emissions, the Global Warming Potential (GWP) of CH_4 is 25 times that of CO_2 and N_20 is 298 times that of CO_2.
Values may not total due to rounding.

SOURCE: ACEIT, 2021; Environmental Science Associates, 2021.

Appendix C

Biological Resources

C-1: Pennsylvania Natural Diversity Inventory (PNDI) Project Planning and Environmental Review Tool – Response

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

BUREAU OF FORESTRY

July 12, 2021

PNDI Number: 734056
Version: Final_1; 5/10/21

Nicholas Schubel
Pittsburgh International Airport
PO Box 12370
Pittsburgh, PA 15231
Email: nschubel@flypittsburgh.com (hard copy will not follow)

Re: AGC Runway Improvements
West Mifflin Township, Allegheny County, PA

Dear Mr. Schubel,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **734056 (Final_1)**. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR’s responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

No Impact Anticipated

PNDI records indicate that no known occurrences of species or resources under DCNR’s jurisdiction occur in the vicinity of the project. Therefore, the project referenced above is not expected to impact plants, terrestrial invertebrates, natural communities, and geologic features of concern. No further coordination with DCNR is needed for this project.

Recommended Voluntary Actions:

- Use a conservative approach to project design that minimizes permanent and temporary disturbances to soil and native vegetation. This will conserve habitat and limit opportunities for invasive plants.
- Clean boot treads, tools, construction equipment, and vehicles thoroughly (especially the undercarriage and wheels) before they are brought on site. This will remove invasive plant seeds and invasive earthworms/cocoons that may have been picked up at other worksites.
- Use clean project materials (e.g., weed-free straw) or materials native to the worksite to avoid introducing invasive species from contaminated sources.
- Revegetate or cover disturbed soil and stockpiles quickly to discourage the germination of invasive plants. Implement proper erosion control practices to stabilize soil and reduce runoff.
- Do not use seed mixes that include invasive species. More information about invasive plants in Pennsylvania can be found at the following link: http://www.dcnr.pa.gov/Conservation/WildPlants/InvasivePlants/Pages/default.aspx
- Use habitat appropriate seed mixes. For example, use a riparian seed mix when reseeding along a waterway. The *Bureau of Forestry Planting & Seeding Guidelines* can be found at the following link for recommendations: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20031083.pdf

- Use native plants for landscaping, revegetation, and stormwater management. Do not use nonnative invasive species. Reduce the area of lawn and impermeable surfaces to the fullest extent practicable in favor of native gardens or habitat restoration (e.g., forest, meadow, wetland, etc.). More information about lawn conversion can be found at the following link: https://www.dcnr.pa.gov/Conservation/Water/LawnConversion/Pages/default.aspx

- Plant forest buffers where trees were historically present along streams, wetlands, and bodies of water. Buffers should be a minimum of 35 feet in width (ideally at least 100 feet in width). Where trees are not appropriate (e.g., powerline rights-of-way), buffer with native shrubs and herbaceous plants. More information about riparian buffers can be found at the following link: https://www.dcnr.pa.gov/Conservation/Water/RiparianBuffers/Pages/default.aspx

- Manage rights-of-way for diverse native plant communities and wildlife (e.g., monarch butterfly). In seed mixes, include wildflowers that have overlapping bloom periods and provide forage for pollinators throughout the growing season. Avoid blanket herbicide applications; instead, spot-treat undesirable tall woody vegetation and invasive weeds. Where mowing is necessary, reduce frequency to once every few years during the dormant season (i.e., after first frost in late fall and before bird nesting in early spring), leaving some refugia for overwintering wildlife.

- Monitor for invasive plants before, during, and after project activities and promptly control any identified infestations. Frequent monitoring allows for early detection and rapid response.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter and a permit has not been acquired, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative, description of project changes and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Jason Ryndock, Ecological Information Specialist, by phone (717-705-2822) or via email (c-jryndock@pa.gov).

Sincerely

Greg Podniesinski

Greg Podniesinski, Section Chief
Natural Heritage Section

C-2: PNDI Project Planning and Environmental Review Tool – Submittal

1. PROJECT INFORMATION

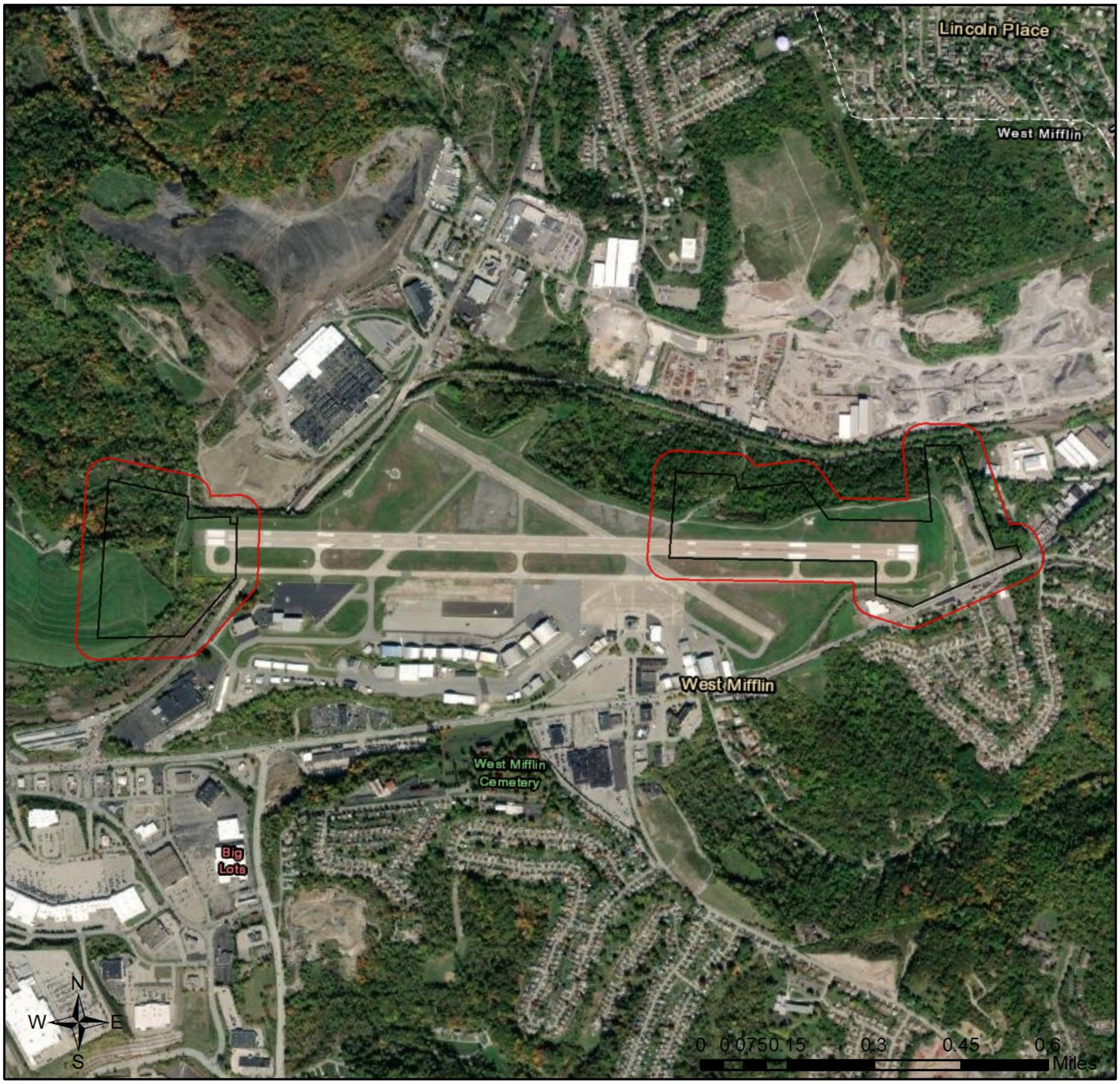
Project Name: **AGC Runway Improvements**
Date of Review: **5/10/2021 08:54:00 AM**
Project Category: **Transportation, Airports (runways, taxiways, terminals, control towers, beacons, fuel depots)**
Project Area: **84.06 acres**
County(s): **Allegheny**
Township/Municipality(s): **WEST MIFFLIN**
ZIP Code:
Quadrangle Name(s): **GLASSPORT**
Watersheds HUC 8: **Lower Monongahela**
Watersheds HUC 12: **Fallen Timber Run-Monongahela River; Streets Run-Monongahela River**
Decimal Degrees: **40.354985, -79.923010**
Degrees Minutes Seconds: **40° 21' 17.9455" N, 79° 55' 22.8350" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

AGC Runway Improvements

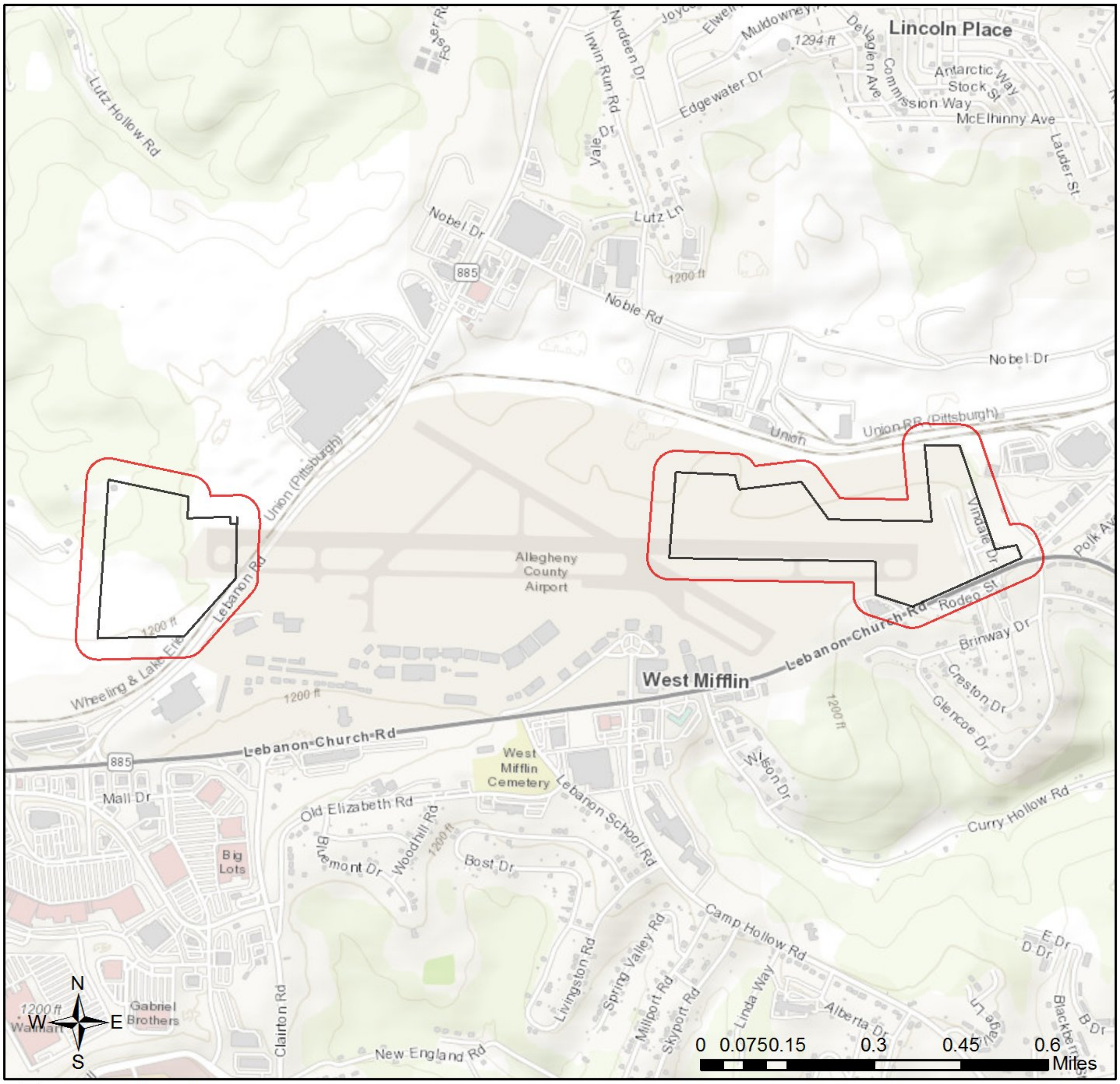


☐ Project Boundary

☐ Buffered Project Boundary

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

AGC Runway Improvements



☐ Project Boundary

🟥 Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

RESPONSE TO QUESTION(S) ASKED

Q1: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q2: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service
RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Dominic Costantini
Company/Business Name: Collective Efforts LLC
Address: 462 Perry Highway
City, State, Zip: 15229
Phone:(412) 459 - 0114 Fax:(____)____
Email: dcostantini@collectiveefforts.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

5/10/2021
date

C-3: Pennsylvania Natural Heritage Program - Allegheny County Comprehensive Species List

PENNSYLVANIA NATURAL HERITAGE PROGRAM - ALLEGHENY COUNTY COMPREHENSIVE SPECIES INVENTORY[1]

Scientific Name	Common Name	Status			Global Rank	State Rank
		Federal	State	Proposed DCNR		
Acipenser fulvescens*	Lake Sturgeon		PE		G3G4	S1
Acris crepitans*	Eastern Cricket Frog		PE		G5	S1
Alasmidonta marginata*	Elktoe				G4	S3S4
Alisma triviale	Northern Water-plantain		PE		G5	S1
Amelanchier humilis	Serviceberry		TU		G5	S1
Amelanchier obovalis	Coastal Juneberry		TU		G4G5	S1
Ammocrypta pellucida*	Eastern Sand Darter		PE		G4	S1
Antennaria virginica	Shale Barren Pussytoes		N		G4	S3
Ardea herodias	Great Blue Heron				G5	S5B,S4N,S4M
Arnoglossum reniforme	Great Indian-plantain		N	PE	G4	S1
Asio flammeus*	Short-eared Owl		PE		G5	S1B,S3N,S2M
Astragalus canadensis	Canadian Milkvetch		N	PE	G5	S1
Baptisia australis	Blue False-indigo		PT		G5	S2
Camassia scilloides	Wild Hyacinth		PT	PE	G4G5	S1
Carex buxbaumii	Brown Sedge		TU	PR	G5	S3
Carex careyana	Carey's Sedge		PE		G4G5	S1
Carex shortiana	Sedge		N		G5	S3
Carex typhina	Cattail Sedge		PE		G5	S2
Castilleja coccinea	Scarlet Indian-paintbrush		TU		G5	S2
Catostomus catostomus*	Longnose Sucker		PE		G5	S1
Chionanthus virginicus	Fringe-tree		N		G5	S3
Chrosomus erythrogaster*	Southern Redbelly Dace		PT		G5	S2
Circus cyaneus*	Northern Harrier		PT		G5	S2B,S3M
Clematis viorna	Vase-vine Leather-flower		PE		G5	S1
Clonophis kirtlandii*	Kirtland's Snake		PE		G2	SH
Corallorhiza wisteriana	Spring Coral-root		TU	PE	G5	S1
Cuscuta polygonorum	Smartweed Dodder		TU		G5	S2
Cypripedium parviflorum var. parviflorum	Southern Small Yellow Lady's-slipper		PE		G5T3T5	S1S2
Delphinium exaltatum	Tall Larkspur		PE		G3	S1
Deschampsia cespitosa	Tufted Hairgrass		N		G5	S3
Dryopteris clintoniana	Clinton's Wood Fern		N		G5	S2
Dryopteris filix-mas ssp. brittonii	Male Fern		N		G5T4?	S1

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[1] Accessed in June, 2021 at: https://www.naturalheritage.state.pa.us/inventories.aspx

Scientific Name	Common Name	Status			Global Rank	State Rank
		Federal	State	Proposed DCNR		
Eleocharis quadrangulata	Four-angled Spike-rush		PE		G5	S1
Epioblasma triquetra*	Snuffbox	LE	PE		G3	S2
Erigenia bulbosa	Harbinger-of-spring		PT		G5	S4
Erythronium albidum	White Trout-lily		N	PR	G5	S3
Falco peregrinus*	Peregrine Falcon		PT		G4	S1B,S5N,S4M
Festuca paradoxa	Cluster Fescue		PE		G5	S1
Fusconaia flava*	Wabash Pigtoe				G5	S2S3
Fusconaia subrotunda*	Longsolid				G3	S2
Haliaeetus leucocephalus*	Bald Eagle		DL		G5	S4B,S5N,S4M
Helianthemum bicknellii	Bicknell's Hoary Rockrose		PE		G5	S2
Hierochloe hirta (Hierochloe hirta ssp. arctica)	Common Northern Sweet Grass			PE	G5	S1
Houstonia canadensis	Fringed Bluets				G4G5	S1
Hypericum drummondii	Nits-and-lice		TU		G5	S1
Iodanthus pinnatifidus	Purple Rocket		PE		G5	S1
Iris cristata	Crested Dwarf Iris		PE		G5	S1
Juncus dichotomus	Forked Rush		PE		G5	S1
Lanius ludovicianus migrans*	Migrant Loggerhead Shrike		PE		G4T3Q	S1B,S1M
Lasionycteris noctivagans*	Silver-haired Bat				G3G4	S1
Lasmigona complanata*	White Heelsplitter				G5	S1S2
Lepomis gulosus*	Warmouth		PE		G5	S3
Leptodea fragilis*	Fragile Papershell				G5	S2S3
Lithospermum canescens	Hoary Puccoon		N		G5	S2
Luzula bulbosa	Southern Wood-rush		TU		G5	S1
Lythrum alatum	Winged-loosestrife		TU	PE	G5	S1
Marshallia pulchra (Marshallia grandiflora)	Beautiful Barbara's-Buttons			PE	G3	S1
Matelea obliqua	Oblique Milkvine		PE		G4?	S1
Meehania cordata	Heartleaf Meehania		TU		G5	S1
Morus rubra	Red Mulberry		N		G5	S2
Myotis lucifugus*	Little Brown Bat		PE		G3	S1
Myotis septentrionalis*	Northern Long-eared Bat	LT	PE		G1G2	S1
Myriophyllum sibiricum	Northern Water-milfoil		PE		G5	S1
Notropis buchanani*	Ghost Shiner		PE		G5	SU
Obliquaria reflexa*	Threehorn Wartyback				G5	S3
Obovaria subrotunda*	Round Hickorynut		PE		G4	S1

Scientific Name	Common Name	Status			Global Rank	State Rank
		Federal	State	Proposed DCNR		
Onosmodium molle var. hispidissimum	False Gromwell		PE		G4G5T4	S1
Opuntia humifusa	Prickly-pear Cactus		PR		G5	S3
Oxypolis rigidior	Stiff Cowbane		TU		G5	S3
Passiflora lutea	Passion-flower		PE	PT	G5	S2
Pedicularis lanceolata	Swamp Lousewort		N		G5	S1S2
Penstemon laevigatus	Beard-tongue		N	Under Review	G5	S3
Physalis virginiana	Virginia Ground-cherry		TU		G5	S1S2
Platanthera peramoena	Purple-fringeless Orchid		PT		G5	S2
Plethobasus cyphyus*	Sheepnose	LE	PT		G3	S1
Pleurobema cordatum*	Ohio Pigtoe				G4	SH
Populus balsamifera	Balsam Poplar		PE		G5	S1
Potamogeton tennesseensis	Tennessee Pondweed		PE		G2G3	S1
Primula meadia	Common Shooting-star		PE		G5	S1
Prunus pumila var. depressa	Low Sand Cherry				G5T5	S1
Ptelea trifoliata	Common Hop-tree		PT		G5	S2
Quadrula quadrula*	Mapleleaf				G5	S3
Quercus shumardii	Shumard's Oak		PE		G5	S2
Ranunculus ambigens	Water-plantain Spearwort		N		G4	S2
Ranunculus flabellaris	Yellow Water-crowfoot		N		G5	S2
Ratibida pinnata	Gray-headed Prairie Coneflower		PE		G5	S1
Rich Hemlock - Mesic Hardwoods Forest	Rich Hemlock - Mesic Hardwoods Forest				GNR	S2S3
Rosa virginiana	Virginia Rose		TU	Under Review	G5	S1
Rudbeckia fulgida	Eastern Coneflower		N		G5	S3
Ruellia strepens	Limestone Petunia		PT		G4G5	S2
Salix myricoides	Broad-leaved Willow		N		G4	S2
Samolus parviflorus	Pineland Pimpernel		TU		G5T5	S3
Scutellaria saxatilis	Rock Skullcap		TU		G3G4	S1
Senna marilandica	Wild Senna		TU		G5	S3
Sistrurus catenatus*	Eastern Massasauga	LT	PE		G3	S1
Sisyrinchium atlanticum	Eastern Blue-eyed Grass		PE		G5	S1
Solidago speciosa var. speciosa	Showy Goldenrod		N		G5T5?	S2
Speyeria idalia*	Regal Fritillary				G3?	S1
Spiranthes lucida	Shining Ladies'-tresses		N		G4	S3
Symphyotrichum drummondii	Hairy Heart-leaved Aster		N		G5	S1

Scientific Name	Common Name	Status			Global Rank	State Rank
		Federal	State	Proposed DCNR		
Symphyotrichum ericoides	White Heath Aster		TU		G5	S3
Theliderma cylindrica*	Rabbitsfoot	LT	PE		G3G4	S1S2
Toxolasma parvum*	Lilliput				G5	S1S2
Trillium cernuum	Nodding Trillium		N		G5	S2
Trillium flexipes	Declined Trillium		TU		G5	S2
Trillium nivale	Snow Trillium		PR		G4	S2
Tritogonia verrucosa*	Pistolgrip		PE		G4G5	S1
Truncilla donaciformis*	Fawnsfoot				G5	S1
Truncilla truncata*	Deertoe				G5	S1
Tufa	Tufa				GNR	SNR
Veratrum virginicum	Virginia Bunchflower		N		G5	S1
Villosa iris*	Rainbow				G5	S3
Vitis cinerea var. baileyana	A Pigeon Grape		TU		G4G5TNR	SH

Source: Accessed in June, 2021 at: https://www.naturalheritage.state.pa.us/inventories.aspx
NOTE: LE = Listed Endangered; LT = Listed Threatened; PE = Pennsylvania Endangered; PT = Pennsylvania Threatened; PR = Pennsylvania Rare; N = No Status. For more description on status codes and ranks, see next page.

State and global conservation rank as assigned by NatureServe, Pennsylvania's legal status, the last time it was seen during a survey of this site, and the estimated quality of the population or community. In general, species are only listed within the species table if they are listed at a state-rank level 3 or higher—that is, if they are considered Vulnerable in the state of Pennsylvania. Species that are ranked at an S4 or S5 (Apparently Secure, or Secure in Pennsylvania) are generally not listed in the species table, even if they are present at the site. Species are also generally only listed in the species table if they have been observed at the site in the last 25 years, and if their presence and identification have been approved by PNHP biologists. Species which have not been seen within this time period, but were once present, are considered "historic" records at that site.

- G1/S1 Critically Imperiled — at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
- G2/S2 Imperiled — at high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
- G3/S3 Vulnerable — at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
- G4/S4 Apparently Secure — uncommon but not rare; some cause for long-term concern due to declines or other factors.
- G5/S5 Secure — common; widespread and abundant.
- GH/S5 Possibly extinct or extirpated — known only from historical records but there is a chance they may still exist.
- GX/SX Presumed extinct or extirpated — no expectation that they still survive.

Appendix D

Climate Change - Impacts on Airports

POTENTIAL IMPACTS OF CLIMATE CHANGE SPECIFIC TO AIRPORTS

Effect of Climate Change / Threat to Airports	Potential Effect to Airports	Potential Remedies
Sea Level Rise: The International Panel on Climate Change (IPCC) and National Oceanic and Atmospheric Administration (NOAA) provide local, predictive models to describe a spectrum of SLR scenarios between intermediate low, which relates to slow, incremental SLR, and extreme, which is a more rapid and aggressive potential outcome*		
• Ocean inundation, including increased incidence of tidal flooding	Restricted runway use, damage to runway and other electrical circuits	Shoreline management; extensive dewatering systems; extend runways or limit aircraft operations due to chronic or persistent wet pavements, which require additional length for safe aircraft operations; relocation
• Saltwater intrusion	Increased corrosion and weathering	Constant repair of subsurface or surface infrastructure
• Increased water table	Problematic stormwater collection/movement restricts storm water drainage potential (disruption/stagnation of hydraulic gradient)	Modification to storm water system
Increased Frequency of Extreme Temperatures: defined as days over 95ºF that may be experienced more frequently and for longer consecutive durations in comparison to known historic patterns.		
• Oppressive and persistent heat	Pavement weathering, warping, cracking, or softening, (especially areas of heavy use and/or high wheel pressure, such as turn areas, and more frequent on older pavements or those incorrectly installed)	Immediate intervention and renovation required due to safety concerns; otherwise, may require accelerated pavement maintenance schedule (currently 20-30 years)
	Increased energy demand	Higher cost for indoor cooling; HVAC system failure; retrofit increased efficiency measures in existing structures; installation of industrial fans or other air circulation methods in areas not currently climate-controlled; cumulative strain on regional utility provider; diminished efficiency of grid and electricity delivery
	Decreased aircraft performance	Operational restrictions; runway extension requirement; increased fuel consumption to compensate for aircraft inefficiencies
	Facility weathering	Increased maintenance requirements; reconstruct with more durable materials
Climate shift: may increase the length of rainy seasons and the duration/intensity of precipitation events in some areas, while causing extended precipitation deficits and protracted droughts in other locations. This change may be experienced as altered seasonality, producing drier springs and summers and profoundly wetter falls and winters**		
• Altered rainfall patterns / increased volume and frequency of precipitation events	Decreased visibility, navigation limitations, and flooding of active airfield movement areas	Mitigate user frustration from frequent storm-related weather delays
	Flooding; decreased capacity of stormwater collection design; establishment of standing water habitat	Modify storm water system; extend runways or limit aircraft operations due to chronic or persistent wet pavements, which require additional length for safe aircraft operations; fill wildlife attractant (e.g., wetland) areas

Effect of Climate Change / Threat to Airports	Potential Effect to Airports	Potential Remedies
	Facility weathering	Increased maintenance requirements; reconstruct with more durable materials
	Increased contact between water and hazardous materials (water quality impacts)	Redesign or reconstruct hazardous material handling areas, including maintenance, fueling, de-icing, or sanitary areas; increased citations and fines for water quality infractions
	Increased scouring / erosion	Increase landscape maintenance and water quality reporting burden, including control sediment deposition in adjacent waterways per NPDES permit
Increased Incidence of Extreme Storm Events: refers to episodic storm events that can produce flash flooding, gusty winds, hail, or tornados. An increasing trend towards extreme storm events has been identified globally and correlated to an existing 0.5ºC increase in average global temperature.		
• High wind	Structural damage or blockage from winds or from foreign objects and debris projectiles, especially airport lighting and signage which are on frangible mounts and designed to break away in aircraft impact.	Airport closes for storm / resumes within minimal timeframe.
• Intense rain, storm surge, and flooding	Storm surge and flooding of paved surfaces restrict use until receded. Temporary, but high-volume water inundation may cause water intrusion to short or destroy sensitive electrical system, disrupt communications, or cause sewer overflow. Increased vulnerability for hazardous material migration (fuel). Extreme volume of standing water likely to temporarily overwhelm stormwater management system.	Airport focuses planning efforts on adaptive capacity and resilience of existing infrastructure and addresses deficiencies in advance of future storm event.
• Widespread regional damage in adjacent communities.	Airport is needed as essential regional facility for evacuation and for import and staging of supplies after storm passes and damages are assessed	Airport repurposes available area for staging and operations; increases staffing and operational flexibility.

REFERENCES:

* International Panel on Climate Change (IPCC), 2018. *Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp. Accessed in November 2020 at: https://www.ipcc.ch/sr15/chapter/spm/

** National Aeronautics and Space Administration (NASA), 2019. *Precipitation Measurement Missions: Climate Change, Trends and Patterns* accessed in November 2020 at: https://pmm.nasa.gov/science/climate-change and NASA 2013, *National Climate Assessment: 21st Century Precipitation Scenarios* accessed in November 2020 at: https://svs.gsfc.nasa.gov/4028

Appendix E

Project Geotechnical Survey Report

E-1: Project Geotechnical Survey Report
E-2: Engineering Design Analysis Drawings

E-1: Project Geotechnical Survey Report

Preliminary Geotechnical Exploration Report

Allegheny County Airport Authority
ACAA Project Number 40G1-20
Runway 28 Safety Area Improvement Project
Allegheny County Airport
Allegheny County, Pennsylvania

GAI Project Number: C191167.00
March 2021

Prepared by: GAI Consultants, Inc.
Pittsburgh Office
385 East Waterfront Drive
Homestead, Pennsylvania 15120-5005

Prepared for: Allegheny County Airport Authority
Landside Terminal
4th Floor Mezzanine
Pittsburgh, Pennsylvania 15231

Preliminary Geotechnical Exploration Report

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Table of Contents

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1.0 Introduction

The Allegheny County Airport Authority (ACAA) is proposing a runway safety area (RSA) improvement project at the Allegheny County Airport (AGC) located in West Mifflin, Pennsylvania (PA). Approval and implementation of the “Proposed Project” will require federal actions that are subject to environmental review under the *National Environmental Policy Act* of 1969 (NEPA). Pursuant to Federal Aviation Administration (FAA) instruction implementing NEPA, the environmental review will be accomplished in the form of an Environmental Assessment (EA). Included in the EA is a geotechnical evaluation used to develop the approximate limits of construction (area of disturbance) for the proposed improvements. This report presents the office review of available literature, the results of a preliminary subsurface exploration and alternative concepts for extending Runway 10/28 to the east and west.

The proposed improvements to both eastern and western ends of Runway 10/28 include the construction of approximately 300 feet by 150 feet Engineered Material Arresting System (EMAS) expansions. The primary focus of this report is the runway extension to the western end of Runway 10/28 because of the quantity and height of embankment material and associated overall limit of disturbance that will we be required to construct the fill slope as well as the constraints at the toe of slope that will impact design. Approximately 607,500 cubic yards (cy) of fill will be placed for the construction of the RSA expansion at the western end of Runway 10/28. Included in the RSA expansion is a 10 feet wide access/maintenance path located at the crest and toe of the proposed fill. To a lesser degree, this report will address the expansion of Runway 10/28 RSA to the east by installing 100,000 cy of fill, and to the north of Runway 10/28 by installing approximately 75,000 cy of fill. The alternative elements described above are depicted in plan on Figures 9 and 12 of the Mater Plan Update RSA Alternatives (Draft McFarland Johnson, November 2018) hereinafter referred to as Figures 1 and 2, respectively.

1.1 Site Description

The AGC is located in West Mifflin, PA and is approximately seven miles southeast of Downtown Pittsburgh, PA. Existing Runway 10/28 is approximately 6,500 feet long by 150 feet wide, has an average elevation of approximately 1,250 feet above sea level, and is oriented at 100 degrees east and 280 degrees west. Runway 10/28 was approximately 5,500 feet long when the airport first opened in 1931, and in 1969, the runway was extended approximately 1,000 feet to the west (in part supported by a structure) over Route 885 and the adjacent railroad.

As mentioned previously, the primary focus of this report is the area to the western end of Runway 10/28. Located to the north of the Project site is the former Continental Can plant which is currently being used as a 625,000 square foot (sf) office facility and a slag dump area used for the training of heavy equipment operators. US Steel’s (USS’s) South Taylor Environmental Park (STEP) is located directly to the west of the western end of Runway 10/28 and extends slightly onto ACAA property. STEP is approximately 500 acres and USS has been using the property for the disposal of iron and steel making byproducts since the early 1990’s (within an engineered landfill, “South Taylor Landfill”). STEP is moderately sloped, vegetated with grass, and its perimeter is secured by a chain-linked fence. An existing drainage ditch is located along the northeast perimeter of the STEP within the security fence. GAI understands that the land-use agreement between ACAA and USS required USS to design STEP to allow for future expansion of the runway. The Project site can be accessed through ACAA property, through the former Continental Can plant from the north, or through STEP from the west. The Project site is moderately sloped and moderately to heavily vegetated with grass and trees. Three USS STEP groundwater monitoring wells are located within the footprint of the Project site. Underground utilities are also present at the Project site including a 24-inch gas-line and USS’s 10-inch (changes to 8-inch outside of Project site) HDPE pipeline servicing STEP. Figure 3 presents the project location map. General site conditions are shown in Photographs 1 through 4.

1.2 Scope of Services

GAI's scope of services was performed in accordance with our proposal dated January 8, 2020. GAI completed the following tasks within the Project scope:

- reviewed site geologic conditions along with available historic topographic maps and aerial photos;
- performed a geotechnical subsurface exploration consisting of nine borings;
- conducted geotechnical and environmental laboratory testing of selected soil and rock samples;
- provided preliminary recommendations for wall foundations including lateral earth coefficients and LPILE parameters;
- provided a summary of site limitations with regard to extending the runway;
- discussed possible effects of contamination on construction activities;
- discussed considerations of extending the fill over the South Taylor Landfill;
- provided recommendations for the subsurface exploration in final design;
- provided preliminary earthwork recommendations;
- provided anticipated groundwater conditions and the potential effects on construction; and
- developed design alternatives for the RSA at the western end of Runway 10/28 which includes a discussion on the pros (advantages and cons (disadvantages) of each alternative.

1.3 Authorization

ACAA authorized GAI to perform the geotechnical services under Contract 4456 dated January 17, 2020.

2.0 Geology and Seismicity

2.1 Subsurface Geology

The Project site is located in the Waynesburg Hills Section of the Appalachian Plateaus Physiographic Province. The topography of the Waynesburg Hills Section is hilly with narrow hilltops and steep-sloped, narrow valleys. The local relief on the uplands is moderate (300 to 600 feet). Elevations range approximately from El. 800 to 1,600 feet.

Bedrock consists of the Pennsylvanian-age Pittsburgh Formation of the Monongahela Group. The Pittsburgh Formation ranges in thickness from about 275 feet to 410 feet (Stoner and others, 1987; McElroy, 1988) and consists of limestone, shale, sandstone, and coal. It contains three major coals, the Sewickley, Redstone, and Pittsburgh. Figure 4 presents the project geological location map.

The Web Soil Survey (Soil Survey Staff, 2020) indicates that the surface soils primarily consist of human transported material comprised of Urban land-Guernsey Complex, gently sloping (UGB) and Urban land-Guernsey complex, moderate steep (UGD). These soils consist of silt loam and silty clay loam weathered from the limestone and calcareous shale.

2.2 Coal Mining

According to the Glassport Quadrangle Coal Resources of Allegheny County, PA Coal Crop Lines, Mined-Out Areas, and Structure Contour Maps (Dodge, 1985), and mine maps from the Pennsylvania Mine Map Atlas, the Pittsburgh coal has been undermined beneath the Project site at an approximate elevation of 1,000 feet. In addition, the mine maps also show that the existing runway has been undermined, generally at elevations between 1,000 feet and 1,020 feet. It is unknown if grouting has been performed beneath the existing runway. Ground surface elevations at the Project site range from 1,122 feet at the toe of the fill to 1,250 feet at the runway, therefore placing the underground mine between 122 and 250 feet below the ground surface at the toe of the fill and the runway, respectively. Sinkholes caused by mine subsidence generally occur when the depth of cover is less than 75 feet; therefore, the risk of sinkholes developing is judged to be relatively low. Surface mining has occurred approximately 900 feet to the west of the western end of Runway 10/28.

2.3 Landslides

According to the Landslides and Related Features of the Glassport Quadrangle (Davies, 1978), the Project site lies within an area that is the least prone to sliding. Areas designated as the least prone to landslides are primarily valley floors, ridge tops, and broad benches. Modifications by excavation and fill may lead to local landslides. The Project site is shown on the landslide map presented in Figure 5.

3.0 Subsurface Exploration

A total of nine borings were drilled to characterize the subsurface conditions within the project site: six borings (B-1 through B-6) within the proposed fill footprint and three borings (B-7, B-8, and B-9) near the location of a possible retaining wall. The borings were drilled from February 19th to March 1st, 2021 by GeoMechanics, Inc. of Elizabeth, PA.

The boring locations were established by a handheld global positioning system unit. GAI monitored the drilling and sampling on a full-time basis and classified the samples obtained. A summary of borings is included in Table 1 and the field boring logs are attached in Appendix A. Locations of the borings are shown on Figure 6.

3.1 Equipment and Methods

The borings were drilled with a CME-55 track-mounted drill rig. Standard Penetration Tests (SPTs) were conducted using an automatic hammer in conjunction with soil sampling at three foot-intervals to refusal. Hollow stem augers, 3.25-inch inside diameter, were used to maintain an open drill hole between soil samples. Upon SPT refusal or auger refusal, NQ2 size rock core samples were obtained in Borings B-7 and B-9. Following the completion of the drilling program, the borings were backfilled with auger cuttings and bentonite chips. Long term monitoring wells were installed in Borings B-5 and B-7. A one-inch polyvinyl chloride was installed with a 5-foot screen within various saturated zones. Depths of screens were determined by GAI after the borings were drilled.

3.2 Environmental Sampling and Screening

GAI conducted environmental screening and environmental soil sampling activities while advancing Borings B-4, B-7, B-8, and B-9. Each split-spoon sample was examined by the GAI field representative immediately after removal from the sampler and visually characterized and inspected for the presence of staining, discoloration, separate phase hydrocarbon product, or other visible indicators of contamination. The samples were scanned with a photoionization detector (PID) for the presence and concentration of volatile organic vapors. Samples were placed in sealed plastic bags to obtain a reading from the PID. PID readings acquired from the samples ranged from non-detectible to 35.1 parts per million above background in ambient air.

GAI collected a total of 8 grab soil samples (two samples each from Borings B-4, B-7, B-8, and B-9) and two water samples (one sample each from Borings B-4 and B-5) for environmental laboratory analyses to evaluate potential near surface and subsurface impacts. Soil samples were collected from the ground surface to approximately 22 feet below ground surface (bgs). Water samples were collected in Borings B-4 and B-5 above the top of rock.

The soil and water samples were placed into laboratory-supplied bottleware. Each sample bottle was labeled and placed on ice to chill the samples to at least four degrees Celsius. A chain-of-custody form was completed for delivery and the samples were submitted to Fairway Laboratories located in Altoona, PA. Soil samples selected for laboratory analysis were submitted for analysis of target analyte list (TAL) metals, polychlorinated biphenyls (PCB), target compound list (TCL), volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAH).

3.3 Soils

Soils encountered during the subsurface exploration generally consisted of fill and/or residual soils over weathered rock underlain by sedimentary bedrock. The Field Boring Logs are presented in Appendix A.

Fill was encountered at the ground surface in Borings B-1, B-3, B-4, B-8, and B-9. Fill material generally consisted of clay and silt with varying amounts of sand and rock fragments, or weathered rock fragments with clay and silt. Weathered rock fill material was loose to medium dense, with uncorrected SPT blow counts ranging from 8 to 18 blows per foot (bpf). Weathered sandstone cobbles and boulders placed as fill were observed in Boring B-8 resulting in SPT blow counts of greater than 50 bpf. Cohesive fill material was stiff to very stiff with pocket penetrometer values ranging from 1.0 to 3.0 tons per square foot (tsf). Six feet of fill material was observed in Borings B-3, B-4, B-8, and B-9; however, 12 feet of fill material was observed to the north at Boring B-1.

Residual material generally consisted of clay and silt with varying amounts of sand and rock fragments, or weathered rock fragments with clay and silt. Residual weathered rock fragments were loose to medium dense, with uncorrected SPT blow counts ranging from 10 to 19 blows per foot (bpf). Cohesive residual material was stiff to very stiff with pocket penetrometer values ranging from 1.5 to 3.5 tons per square foot (tsf). Residual material ranged from 3.0 to 15.0 feet thick. Weathered rock was encountered at depths ranging from of 3.5 to 15.0 feet bgs. The consistency of weathered rock was medium dense to very dense with uncorrected SPT blow counts ranging from 26 to greater than 50 blows per foot (bpf).

3.4 Rock

Top of rock was encountered at depths ranging from 9.0 to 21.5 feet below the ground surface. Approximately 12.5 feet of rock was cored at Borings B-7 and B-9 and generally consisted of alternating layers of limestone, shale, and claystone. Recovery ranged from 24% to 100% with an average of 80% while the rock quality designation (RQD) ranged from 0% to 67% with an average of 32%.

3.5 Groundwater

Groundwater measurements were taken at the completion of drilling (0-HR), prior to coring rock (Pre-core) and 24-hour to 6-day readings were obtained for borings converted to monitoring wells or equipped with temporary standpipe. Groundwater was observed in Borings B-2, B-4, and B-5 at depths between 7.6 and 14.2 feet below the ground surface. Groundwater readings were recorded on the logs in Appendix A and are summarized in Table 1.

Water level measurements have been made in the borings at the times and under the conditions indicated herein. It should be noted, however, that ground water levels may fluctuate due to variations in rainfall, site grading or other factors not evident at the times these measurements were made. Those preparing design drawings, specifications and construction plans should assume that variations will occur.

4.0 Laboratory Testing

4.1 Geotechnical Laboratory Testing

Laboratory testing was performed on selected soil and rock core samples collected during the subsurface exploration. The laboratory testing program was performed by Geotechnics of East Pittsburgh, PA. Testing included soil classification and rock strength tests. The results are summarized in Table 2. The laboratory test data are presented in Appendix B.

Selected soil samples were tested for moisture content, grain size distribution, and Atterberg limits. The selected soil jar samples classified as a Fat Clay (CH), Lean Clay, Lean Clay with Sand, Sandy Lean Clay, or Sandy Lean Clay with Gravel (CL) with plasticity indices (PIs) ranging from 11 to 40 percent and moisture contents between 9.4 and 41.6 percent.

Unconfined compressive strength tests were performed on three rock core samples from Borings B-7 and B-9. The unconfined compressive strength for the claystone was 30 and 100 pounds per square inch (psi) and the limestone was 16,180 psi.

4.2 Soil Analytical Laboratory Analysis Results

Tables 3 through 6 present the soil quality data for the eight soil samples analyzed during this investigation. The Fairway Laboratory analytical report is provided in Appendix C. The soil analytical data were compared to the non-residential PA Department of Environmental Protection (PADEP) Medium Specific Concentrations (MSC), and PADEP Management of Fill Policy Clean Fill Concentration Limits (CFCL). Analytical parameter concentrations exceeding one or more of the applicable standards are highlighted.

Review of the soil quality data in Table 3 indicates that 17 metal parameters were detected at concentrations above their respective laboratory reporting limits in one or more of the soil samples submitted for analysis. Of these parameters, manganese and vanadium were detected at concentrations above one or more of their respective MSCs and/or CFCLs. Metals detected at concentrations exceeding applicable standards are described below:

- Manganese was detected at a concentration above the non-residential soil to groundwater MSC and CFCL of 2,000 milligrams/kilogram (mg/kg) in the 21.0 to 21.8 feet bgs sample collected from soil Boring B-4 (3,420 mg/kg).
- Vanadium concentrations exceeded the CFCL of 15 mg/kg in each of the eight soil samples submitted for analysis. Vanadium concentrations ranged from 20.9 mg/kg in the 3.0-4.5 feet sample collected from Boring B-7 to 51.2 mg/kg in the 21.0-21.8 feet sample collected from Boring B-4.

Review of the soil quality data in Table 4 indicates no PCB isomers were detected at concentrations above their respective laboratory reporting limits in the soil samples submitted for analysis.

Review of the soil quality data in Table 5 indicates no PAH parameters were detected at concentrations above their respective laboratory reporting limits in the soil samples submitted for analysis. Review of the soil quality data in Table 6 indicates four VOC parameters [acetone, benzene, 2-butanone (MEK), and toluene] were detected at concentrations above their respective laboratory reporting limits in one or more of the soil samples submitted for analysis. The detected concentrations are well below their applicable MSCs and CFCLs.

Manganese and vanadium are both naturally occurring constituents that may be present in the Site soil and not associated with the landfill. Specifically, the frequency of detection and the range of concentrations observed indicate the detected vanadium may represent background naturally occurring concentrations. The detected concentrations of manganese and vanadium do not exceed the non-residential direct contact MSCs, and therefore are not considered an exposure risk for site earthmoving activities.

4.3 Groundwater Analytical Laboratory Analysis Results

Tables 7 through 10 present the groundwater quality data for the two groundwater samples, collected from Borings B-4 and B-5 and analyzed during this investigation. The Fairway Laboratory analytical report is provided in Appendix C. The groundwater analytical data were compared to the PADEP groundwater MSCs under both a residential and non-residential scenario for used aquifers and total dissolved solids (TDS) less than or equal to 2,500 milligrams per liter (mg/L). Analytical parameter concentrations exceeding one or more of the applicable standards are highlighted.

Review of the groundwater quality data in Table 7 indicates that 14 metal parameters were detected at concentrations above their respective laboratory reporting limits in the groundwater samples submitted for analysis. Of these, four parameters (cobalt, lead, manganese and vanadium) were detected in one or more groundwater samples at concentrations above their respective MSCs. A summary of the parameter exceedances is provided below:

- Cobalt was detected at concentrations above its corresponding residential MSC of 13 micrograms per liter (ug/L) in the sample collected from B-5 (24.1 ug/L).
- Lead was detected at concentrations above its corresponding residential and non-residential MSC of 5 ug/L in both samples submitted for analysis, with concentrations of 9.9 ug/L (B-4) and 33.3 ug/L (B-5).
- Manganese was detected at concentrations above its corresponding residential and non-residential MSC of 300 ug/L in both samples submitted for analysis, with concentrations of 322 ug/L (B-4) and 865 ug/L (B-5).
- Vanadium was detected at concentrations above its corresponding residential MSC of 2.9 ug/L and non-residential MSC of 8.2 ug/L in both samples submitted for analysis, with concentrations of 28.7 ug/L (B-4) and 32.9 ug/L (B-5).

Review of the groundwater quality data in Table 8 indicates no PCB isomers were detected at concentrations above their respective laboratory reporting limits in the groundwater samples submitted for analysis.

Review of the groundwater quality data in Table 9 indicates no PAH isomers were detected at concentrations above their respective laboratory reporting limits in the groundwater samples submitted for analysis.

Review of the groundwater quality data in Table 10 indicates two VOC parameters [acetone and 2-butanone (MEK)] were detected at concentrations above their respective laboratory reporting limits in the Boring B-4 sample. The detected concentrations are well below their applicable MSCs.

5.0 Fill Slope Alternatives

The typical inclination of an engineered fill (embankment) slope is 2 Horizontal to 1 Vertical (2H:1V). Preliminary grading plans showing the 2H:1V fill slope at the eastern and western ends of Runway 10/28 are presented in Figure 7. Steeper slopes or walls are often constructed because of right-of-way or other restrictions. At the project site, a 2H:1V slope will be possible to construct within the existing limits of the AGC property for most of the project footprint. However, the constraints at the southwest corner of the fill slope proposed for the RSA at the western end of Runway 10/28, i.e., the STEP facility and an existing drainage pipe, will require either steepening the slope locally or a retaining wall alternative. Therefore, alternatives considered for the western end of Runway 10/28 RSA include a 2H:1V fill slope and retaining wall or a steepened slope utilizing either a reinforced soil slope (RSS) or specialized materials such as rock or slag. Figure 8 shows a conceptual cross section for the proposed 2H:1V slope along with typical toe key and bonding bench dimensions. Alternative measures to accommodate the constraints imposed by the access/maintenance path and drainage ditch along the southwest portion of the toe are discussed in the sections below and are depicted in Figures 9 and 10.

An additional alternative was considered to extend the 2H:1V slope onto STEP without a retaining wall; however, construction would require ground disturbance for activities such as the excavation for toe keys and bonding benches within the South Taylor Landfill area, access road construction, Air Operations Area fence installation, and the relocation of an existing drainage ditch that is part of the landfill design. Additionally, an analysis would need to be performed to determine the effects of the aforementioned construction on the stormwater management at STEP. GAI has requested STEP as-built drawings as well as the land-use agreement between US Steel and ACAA; however, neither set of documents has been provided to date. An evaluation of the feasibility of extending the fill out onto STEP has not been performed at the time of this report as this was previously determined to be the least desirable alternative for ACAA.

Each of the following alternatives to improve the western end of Runway 10/28 assumes the following for the eastern and northern areas of Runway 10/28:

- at the eastern end of Runway 10/28 RSA, approximately 100,000 cy of fill will be installed at a 2H:1V withing AGC property and without need to install a retaining wall, and
- to the north of the Runway 10/28, approximately 75,000 cy of fill will be installed within AGC property and without need to install a retaining wall.

5.1 Alternative A: 1.5H:1V RSS

RSS utilize geosynthetic reinforcement to increase stability, allowing for a steeper slope angle at the face of an embankment. Figure 9, detail A.1 presents a conceptual sketch of a 1.5H:1V RSS. Figure 9, detail A.2 presents approximate clearance from the existing STEP fence. Advantages of an RSS include the following:

- can typically be constructed as steep as 0.5H:1V.
- most general earthwork contractors are familiar with this type of construction;
- the slope face can be revegetated for an aesthetic, native appearance;
- smaller footprint compared to 2H:1V fill slope and retaining wall alternative; and
- does not require wall face elements and associated long-term maintenance.

Typically, a major disadvantage of an RSS is the required labor to install the geosynthetic materials. Other disadvantages include additional excavation that is needed to install the reinforcement which is generally a minimum of 70 percent of the embankment height (reinforcement lengths to be determined during analysis) and potentially excavating into the runway footprint. A specialty subcontractor may be required to properly construct the RSS.

5.2 Alternative B: 1.5H:1V Rock/Slag Fill Slope

Constructing fill slopes using a specialty material such as rock or slag utilizes the materials higher angle of internal friction, allowing for a steeper slope angle at the face of the embankment. Figure 9, detail B.1 presents a conceptual sketch of a 1.5H:1V fill slope using rock/slag. Figure 9, detail B.2 presents approximate clearance from the existing STEP fence. Advantages of rock/slag include the following:

- most general earthwork contractors are familiar with this type of construction.
- relatively straightforward to install and maintain;
- smaller footprint compared to 2H:1V fill slope and retaining wall alternative; and
- rock is usually readily available.

Disadvantages include the following:

- the face cannot be easily vegetated;
- minor sloughing may occur after installation; and
- additional studies are required for borrow sources and properties of slag.

5.3 Alternative C: 2H:1V Soil Fill Slope with Soldier Pile and Lagging Wall

Constructing a soldier pile and lagging (SP&L) retaining wall to retain the fill near the drainage ditch allows for the construction of a 2H:1V fill slope along the southwest end of the RSA improvement. Figure 10, detail C.1 presents a conceptual sketch of an 2H:1V fill slope with a pile and lagging retaining wall. Figure 10, detail C.2 presents approximate clearance from the existing STEP fence. Advantages of a pile and lagging wall include the following:

- most general earthwork contractors are familiar with this type of construction;
- homogeneous appearance of fill slope;
- less excavation into the existing fill slope than RSS; and
- can provide vertical face.

Disadvantages include the following:

- a specialty subcontractor may be required to construct the SP&L wall;
- not as aesthetically pleasing compared to RSS;
- access is required for drill rig;
- embedment depth is highly dependent on subsurface conditions;
- higher cost to construct; and
- long-term maintenance and inspection costs.

5.4 Alternative D: 2H:1V Soil Fill Slope with Mechanically Stabilized Earth Wall

Constructing a mechanically stabilized earth (MSE) wall to retain the fill near the southwest corner is considered to avoid the constraints. Figure 10, detail D.1 presents a conceptual sketch of an 2H:1V fill slope with a MSE retaining wall. Figure 10, detail D.2 presents approximate clearance from the existing STEP fence. Advantages of a MSE wall include the following:

- most general earthwork contractors are familiar with this type of construction;
- potential for less excavation versus RSS;
- can provide a near vertical face; and
- aesthetically pleasing appearance can be achieved with variety of facing types.

Disadvantages include the following:

- a specialty subcontractor may be required to construct the MSE wall;
- will have to import select backfill material;
- the face cannot be vegetated;
- higher cost to construct; and
- long-term maintenance and inspection costs.

6.0 Recommendations

The following recommendations are based upon data concerning the proposed Project and the site conditions available at the time of the subsurface exploration.

6.1 Additional Subsurface Exploration and Laboratory Testing

GAI recommends that an additional subsurface exploration and laboratory testing program be performed for the final design phase. For RSA locations to the west and east ends of Runway 10/28 and for the fill to the north of the existing airport, additional borings should be drilled along the fill slope at the crest, mid-slope, and at the locations of toe keys. Additional borings for a possible retaining wall included in alternatives for the RSA to the western end of Runway 10/28 may be required when the final type and location is determined.

6.2 Slope Design and Construction

The proposed RSA Improvement will likely consist of a 2H:1V soil fill slope with a locally steepened 1.5H:1V slope at the southeastern corner of embankment placed at the western end of Runway 10/28, utilizing an RSS or a rock/slag material. Toe keys will be required where the toe of the fill meets the existing grade. Toe key dimensions will be based upon stability analyses performed in the final design phase. Toe keys should be constructed to a minimum of three feet into competent stable material with a bottom width not less than ten feet. For the purposes of the limits of work, assume toe keys extend ten feet away from the toe of the slope. Bonding benches into the existing fill slope will be required and should be extended into competent, stable soil to key fill into the existing slope and facilitate compaction of fill in horizontal lifts. The actual depth of toe keys and bonding benches may vary based on encountered field conditions.

RSS (and MSE walls) should be designed using a minimum reinforcement length determined through slope stability, bearing resistance, and sliding resistance analyses. Reinforced slopes (and MSW walls) should be constructed in accordance with the Federal Highway Administration’s specifications.

Potential borrow sources for soil and a specialty material such as rock or slag should be explored prior to final design. The availability, cost, and quality of borrow material or the lack thereof may affect which alternative is selected for final design. Strength and chemical testing should be performed on potential borrow source materials to determine design parameters and suitability for the proposed application. Slope stability, bearing resistance, and sliding resistance analyses should coincide with the selection of borrow source material to ensure a satisfactory factor of safety can be obtained.

6.3 Retaining Walls

A retaining wall may be selected to support the proposed fill along the southwest corner of the fill slope at the western end of Runway 10/28. Based on preliminary survey information available at this time, the wall is estimated to be approximately 200 feet long and 15 feet tall. GAI has considered either a SP&L wall or a MSE wall.

Design and global stability analyses for the selected retaining wall should be performed using soil and rock design parameters developed from the subsurface exploration and laboratory testing described in Section 6.1. Analyses are required for SP&L walls include pile embedment, spacing, and sizing and analyses for an MSE wall include bearing, overturning, and sliding resistance. Final design of both types of walls will also include the structural design of permanent wall facing.

6.4 Preliminary Soil Parameters

Preliminary soil parameters have been developed based on the findings of the subsurface exploration and laboratory testing program and are presented in Table 11.

6.5 Environmental

If planned construction will result in the generation of excess soil that cannot be reused on the site, a Soil Management Plan (SMP) should be developed. The SMP should include procedures for the proper management, storage, sampling, transportation, reuse and/or disposal of potentially impacted soil. The SMP should also describe procedures for the identification and management of unexpected wastes or other impacted media that may be encountered. The SMP should be developed in accordance with the PADEP’s Management of Fill Policy in effect at the time of excavation.

Shallow groundwater was only sporadically encountered beneath the site and at varying elevations, GAI is of the opinion that the encountered groundwater may represent perched conditions that may be seasonally present. Because lead, manganese, and vanadium were detected at concentrations above the non-residential MSCs, construction personnel should avoid direct contact with encountered groundwater. If groundwater is anticipated to be encountered during construction activities, a site-specific Health and Safety Plan should be developed to address potential exposure to impacted groundwater. In addition, if planned construction activities will involve dewatering of excavations, a

Groundwater Management Plan (GMP) should be developed. The GMP should include procedures for the proper management, storage, sampling, transportation, infiltration and/or disposal of potentially impacted groundwater. The GMP should include procedures for discharging and infiltrating extracted water within the Project site boundary, and procedures for required sampling and analysis if extracted groundwater is to be disposed offsite.

6.6 Cost Comparison

Once final grading is completed, cost estimates should be developed for each of the alternatives considered for design. Alternatives should be discussed with a contractor who is familiar with the site and who has performed similar projects. The subsurface profile presented in Figure 11 may be used for preliminary cost estimates for a retaining wall.

7.0 Design Review

Information on the depths and thicknesses of the subsurface strata and groundwater levels described in this Report exist only at the specific locations of the borings and at the particular times the borings were made. It is possible that the passage of time may result in a change in the soil and rock conditions and/or groundwater levels at these boring locations, and that the subsurface conditions and/or water levels between the test borings may also vary from those described in this Report. Those preparing design drawings, specifications, and construction plans should assume that variations will occur.

This Report is limited to the specific Project and location described herein and represents GAI's understanding of the significant aspects of geology, subsurface conditions, and features to be constructed at the Project site. If there are differences in the locations of the proposed facilities and/or design features from those described herein, or should additional background information become available, we should be informed so that, if necessary, we may modify or revise the interpretations, conclusions, and recommendations and determine if additional exploration, testing, and analyses are warranted prior to final design of the facilities. GAI should monitor any additional exploration, testing, earthwork construction, and other construction activities so they are conducted according to the intent of our recommendations and any unanticipated conditions may be recognized and properly reconciled.

8.0 References

Dodge, C. H. 1985. Coal Resources of Allegheny County, PA, Part 1. Coal Crop Lines, Mined-Out Areas, and Structure Contours, Mineral Resource Report 89, PA Bureau of Topographic and Geologic Survey.

Davies, W. E. 1979. Landslides and Related Features, Pennsylvania; Glassport Quadrangle. United States Geological Survey.

Pennsylvania Department of Environmental Protection, Pennsylvania Mine Map Atlas, Available online at https://www.minemaps.psu.edu/. Accessed January 2021.

Reese, L. C., Wang, S. T., Isenhower, W. M., and Arrellage, J. A. 2004. Computer program LPILE Plus Version 5.0 Technical Manual. Ensoft, Inc. July 2004.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2021. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed January 2021.

TABLES

BY:RRJ 05-MAR-2021
Ck: CAL 22-MAR-2021

Table 1
Summary of Borings
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, Pennsylvania

Boring	Date Completed	Approximate Location		Approximate Ground Surface Elevation (ft)	Total Depth (ft)	Soil Thickness (ft)	Weathered Rock Thickness (ft)	Top of Rock		Total Rock Cored (ft)	Groundwater				Comments
		Latitude	Longitude					Depth(1) (ft)	Approximate Elevation (ft)		Depth (ft)	Time	Depth (ft)	Time	
B-1	2/25/2021	40.355173	-79.942382	1162.0	24.1	12.0	1.0	13.0	1149.0	-	DRY	0-hr	DRY	24-hr	-
B-2	2/25/2021	40.354864	-79.943184	1124.0	21.3	15.0	6.0	21.0	1103.0	-	14.2	0-hr	7.6	24-hr	-
B-3	2/19/2021	40.35466	-79.94189	1198.0	9.2	6.0	3.0	9.0	1189.0	-	DRY	0-hr	-(2)	-	Boring Moved ~40' upslope to avoid utilities. Boulder from 2.0' to 5.5' BGS.
B-4	2/24/2021	40.354429	-79.94364	1118.0	24.3	12.0	6.5	18.5	1099.5	-	DRY	0-hr	13.4	24-hr	-
B-5	2/22/2021	40.354082	-79.942577	1174.0	24.2	9.0	4.0	13.0	1161.0	-	DRY	0-hr	10.9	144-hr	-
B-6	2/19/2021	40.353879	-79.941827	1200.0	9.2	3.5	5.5	9.0	1191.0	-	DRY	0-hr	-(2)	-	Difficult augering starting at S-2.
B-7	2/26/2021	40.353894	-79.94329	1140.0	21.5	9.0	0.0	9.0	1131.0	12.4	DRY	Pre-Core	18.2	24-hr	Difficult to set augers.
B-8	2/24/2021	40.353713	-79.94274	1169.0	25.1	9.0	12.5	21.5	1147.5	-	DRY	0-hr	DRY	24-hr	Difficult augering at ground surface. Slow auger advancement from 7.5' to 9.0' BGS
B-9	3/1/2021	40.353388	-79.942385	1162.0	29.5	6.0	10.0	16.0	1146.0	12.4	DRY	Pre-Core	28.4	0-hr	Auger refusal at 17.0'

Notes and Abbreviations:

Pre-Core - Water measurements at the end of Standard Penetration Testing before coring.

0-HR - Water measurements at the end of Standard Penetration Testing or immediately after coring.

(1) The top of rock was estimated based on rock coring, SPT refusal and/or auger refusal.

(2) Borings were backfilled immediately upon completion.

Table 2
Summary of Laboratory Test Data
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Table 2A - Soil Index Properties

Boring No.	Sample I.D.	Sample Depth (ft)	SOIL INDEX PROPERTIES									In-situ Parameters
			Classification			USCS Grain Size Distribution			Atterberg Limits			
			Color	USCS	USCS Symbol	Gravel (%)	Sand (%)	Silt & Clay (%)	LL	PL	PI	w_{nat} (%)
B-1	S-3	6.0 - 7.5	Brown	Lean Clay	CL	5.92	7.45	86.63	44	23	21	22.8
B-2	S-2	3.0 - 4.5	Brown	Lean Clay with Sand	CL	0.18	15.40	84.42	46	27	19	19.1
B-4	S-2	3.0 - 4.5	Brown	Sandy Lean Clay	CL	2.31	35.41	62.29	34	18	16	11.6
B-5	S-2	3.0 - 4.5	Brown	Fat Clay	CH	1.17	5.23	93.59	63	23	40	41.6
B-7	S-2	3.0 - 4.5	Brown	Sandy Lean Clay with Gravel	CL	16.46	19.34	64.19	30	19	11	20.0
B-8	S-3	6.0 - 7.5	Brown	Lean Clay with Sand	CL	0.00	19.09	80.91	46	19	27	22.8
B-9	S-2	3.0 - 4.5	Brown	Lean Clay with Sand	CL	7.36	22.57	70.07	34	16	18	16.1
B-3	S-2	3.0 - 3.7	Brown	Sandy Lean Clay with Gravel	CL	16.36	19.99	63.64	47	22	25	18.6
B-1	S-2	3.0 - 4.5	-	-	-	-	-	-	-	-	-	29.4
B-1	S-5	12.0 - 13.4	-	-	-	-	-	-	-	-	-	17.1
B-2	S-3	6.0 - 7.5	-	-	-	-	-	-	-	-	-	20.9
B-2	S-5	12.0 - 13.5	-	-	-	-	-	-	-	-	-	29.7
B-4	S-3	6.0 - 7.5	-	-	-	-	-	-	-	-	-	16.7
B-4	S-4	9.0 - 10.5	-	-	-	-	-	-	-	-	-	21.7
B-5	S-3	6.0 - 7.5	-	-	-	-	-	-	-	-	-	30.4
B-6	S-2	3.0 - 4.5	-	-	-	-	-	-	-	-	-	9.4
B-7	S-3	6.0 - 7.5	-	-	-	-	-	-	-	-	-	16.5
B-8	S-4	9.0 - 10.5	-	-	-	-	-	-	-	-	-	14.6
B-9	S-3	6.0 - 7.5	-	-	-	-	-	-	-	-	-	13.8

Table 2B - Rock Properties (Unconfined Compressive Strengths)

Boring No.	Core Run I.D.	Sample Depth (ft)	ROCK CORE PROPERTIES		
			Rock Type	Moist Unit Weight (pcf)	q_u (psi)
B-7	R-1	9.1 - 10.0	Limestone	161.0	16,180
B-7	R-4	15.6 - 17.4	Claystone	128.7	30
B-9	R-2	20.0 - 20.7	Claystone	135.6	100

Table 3
Summary of Soil Quality Data - Metals
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Non-Residential SHS MSC	Non-Residential Direct Contact MSC		Clean Fill Concentration Limit	Units	B-4-1	B-4-2	B-7-1	B-7-2	B-8-1	B-8-2	B-9-1	B-9-2
		Surface Soil (0-2 ft)	Subsurface Soil (2-15 ft)			0.0-1.5 Feet	21-21.8 Feet	3.0-4.5 Feet	6.0-7.5 Feet	6.0-10.5 Feet	18.0-21.7 Feet	3.0-4.5 Feet	12.0-12.9 Feet
Aluminum	NS	190,000	190,000	190,000	mg/kg	27,900	22,900	3,720	5,960	14,700	15,000	8,670	14,600
Antimony	27	1,300	190,000	27	mg/kg	<5.13	<4.75	<5.66	<5.26	<5.53	<5.00	<5.78	<4.94
Arsenic	29	61	190,000	12	mg/kg	5.63	<3.80	<4.52	<4.21	<4.42	<4.00	<4.63	<3.95
Barium	8,200	190,000	190,000	8,200	mg/kg	152	95.7	78.9	77.1	131	138	119	104
Beryllium	320	6,400	190,000	320	mg/kg	<1.03	1.18	<1.13	<1.05	<1.11	<1.00	<1.16	<0.989
Cadmium	38	1,600	190,000	38	mg/kg	<2.05	<1.90	<2.26	<2.11	<2.21	<2.00	<2.31	<1.98
Calcium	NS	NS	NS	NS	mg/kg	2,270	18,900	264,000	263,000	191,000	164,000	201,000	130,000
Chromium	190,000	190,000	190,000	190,000	mg/kg	33.1	29.5	4.6	7.67	15.7	16.4	10.3	16.5
Cobalt	160	960	190,000	59	mg/kg	15.1	21.9	<5.66	<5.26	6.68	5.55	6.2	7.92
Copper	43,000	120,000	190,000	8,100	mg/kg	19.3	33.7	14.4	14.5	18	17.3	19.1	16.4
Iron	NS	190,000	190,000	150,000	mg/kg	36,700	97,300	10,100	9,470	14,200	14,200	14,800	13,100
Lead	450	1,000	190,000	450	mg/kg	16.8	13.8	<4.52	<4.21	6.47	5.51	5.84	7.4
Magnesium	NS	NS	NS	NS	mg/kg	8,120	12,400	48,800	47,900	32,900	57,400	36,400	44,000
Mercury	10	510	190,000	10	mg/kg	<0.0390	<0.0325	<0.0366	<0.0323	<0.0371	<0.0298	<0.0299	<0.0315
Nickel	650	64,000	190,000	650	mg/kg	32.6	51.2	<28.3	<26.3	<27.6	<25.0	<28.9	<24.7
Manganese	2,000	150,000	190,000	2,000	mg/kg	448	3,420	666	635	560	433	633	364
Potassium	NS	NS	NS	NS	mg/kg	2,700	2,730	1,690	2,720	4,780	6,120	1,870	5,700
Selenium	26	16,000	190,000	26	mg/kg	<10.3	<9.50	<11.3	<10.5	<11.1	<10.0	<11.6	<9.89
Silver	84	16,000	190,000	84	mg/kg	<2.05	<1.90	<2.26	<2.11	<2.21	<2.00	<2.31	<1.98
Sodium	NS	NS	NS	NS	mg/kg	<513	<475	<566	<526	<553	702	<578	587
Thallium	14	32	190,000	2.2	mg/kg	<10.3	<9.50	<11.3	<10.5	<11.1	<10.0	<11.6	<9.89
Vanadium	820	220	190,000	15	mg/kg	45.4	51.2	20.9	22.6	34.2	31.9	25.9	25.9
Zinc	12,000	190,000	190,000	12,000	mg/kg	78	128	15.5	16	35.5	34	31.8	43.2

Notes:

All analytical data reported in milligrams per kilogram (mg/kg), or parts per million.

SHS MSC - Statewide Health Standard Medium-Specific Concentration.

< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.

Shaded values exceed the applicable standard

NS - No Standard for Parameter

Table 4
Summary of Soil Quality Data - Polychlorinated Biphenyls
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Residential Direct Contact SHS MSC	Non-Residential Direct Contact MSC		Clean Fill Concentration Limit	Units	B-4-1	B-4-2	B-7-1	B-7-2	B-8-1	B-8-2	B-9-1	B-9-2
				Surface Soil (0-2 ft)	Subsurface Soil (2-15 ft)			0.0-1.5 Feet	21-21.8 Feet	3.0-4.5 Feet	6.0-7.5 Feet	6.0-10.5 Feet	18.0-21.7 Feet	3.0-4.5 Feet	12.0-12.9 Feet
PCB, Total	NA	NA	NA	NA	NA	50	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1016 (Aroclor 1016)	10	47	9	46	10,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1221 (Aroclor 1221)	0.18	0.83	9	46	10,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1232 (Aroclor 1232)	0.14	0.7	9	46	10,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1242 (Aroclor 1242)	4	20	9	46	10,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1248 (Aroclor 1248)	18	81	9.3	46	10,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1254 (Aroclor 1254)	75	340	4.4	46	10,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011
PCB-1260 (Aroclor 1260)	170	770	9	46	190,000	NS	mg/kg	<0.011	<0.011	<0.012	<0.011	<0.011	<0.011	<0.012	<0.011

Notes:

All analytical data reported in milligrams per kilogram (mg/kg), or parts per million.
SHS MSC - Statewide Health Standard Medium-Specific Concentration.
< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.
Shaded values exceed the applicable standard
NS - No Standard for Parameter

Table 5
Summary of Soil Quality Data - Polycyclic Aromatic Hydrocarbons
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Residential Direct Contact SHS MSC	Non-Residential Direct Contact MSC		Clean Fill Concentration Limit	Units	B-4-1	B-4-2	B-7-1	B-7-2	B-8-1	B-8-2	B-9-1	B-9-2
				Surface Soil (0-2 ft)	Subsurface Soil (2-15 ft)			0.0-1.5 Feet	21-21.8 Feet	3.0-4.5 Feet	6.0-7.5 Feet	6.0-10.5 Feet	18.0-21.7 Feet	3.0-4.5 Feet	12.0-12.9 Feet
Acenaphthene	3,100	4,700	13,000	190,000	190,000	3,100	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Acenaphthylene	2,800	8,000	13,000	190,000	190,000	2,800	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Anthracene	350	350	66,000	190,000	190,000	350	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Benzo(a)anthracene	25	320	6	130	190,000	6	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Benzo(a)pyrene	46	46	0.58	12	190,000	0.58	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Benzo(b)fluoranthene	26	170	3.5	76	190,000	3.5	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Benzo(g,h,i)perylene	180	180	13,000	190,000	190,000	180	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Benzo(k)fluoranthene	210	610	4	76	190,000	4	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Chrysene	230	230	35	760	190,000	35	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Dibenz(a,h)anthracene	25	270	1	22	190,000	1	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Fluoranthene	3,200	3,200	8,800	130,000	190,000	3,200	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Fluorene	3,400	3,800	8,800	130,000	190,000	3,400	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Indeno(1,2,3-cd)pyrene	1,500	22,000	3.5	76	190,000	3.5	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Naphthalene	25	25	160	760	190,000	25	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Phenanthrene	10,000	10,000	66,000	190,000	190,000	10,000	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378
Pyrene	2,200	2,200	6,600	96,000	190,000	2,200	mg/kg	<0.405	<0.370	<0.403	<0.396	<0.387	<0.370	<0.384	<0.378

Notes:

All analytical data reported in milligrams per kilogram (mg/kg), or parts per million.

SHS MSC - Statewide Health Standard Medium-Specific Concentration.

< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.

Shaded values exceed the applicable standard

NS - No Standard for Parameter

Table 6

Summary of Soil Quality Data - Volatile Organic Compounds
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Residential Direct Contact SHS MSC	Non-Residential Direct Contact MSC		Clean Fill Concentration Limit	Units	B-4-1	B-4-2	B-7-1	B-7-2	B-8-1	B-8-2	B-9-1	B-9-2
				Surface Soil (0-2 ft)	Subsurface Soil (2-15 ft)			0.0-1.5 Feet	21-21.8 Feet	3.0-4.5 Feet	6.0-7.5 Feet	6.0-10.5 Feet	18.0-21.7 Feet	3.0-4.5 Feet	12.0-12.9 Feet
Acetone	3,800	10,000	10,000	10,000	10,000	3,800	mg/kg	<0.907	<0.0094	<0.0069	<0.0064	<0.0119	0.016	<0.0105	<0.0098
Benzene	0.5	0.5	57	290	330	0.5	mg/kg	<0.0016	0.0186	0.0059	<0.0013	0.0054	0.0209	0.0057	<0.0020
Bromodichloromethane	8	8	12	60	69	8	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Bromoform	8	8	410	2,000	2,300	8	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Bromomethane	1	1	96	400	460	1	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
2-Butanone (MEK)	400	400	10,000	10,000	10,000	400	mg/kg	0.0179	<0.0094	<0.0069	<0.0064	<0.0119	<0.0102	<0.0105	<0.0098
Carbon disulfide	150	620	10,000	10,000	10,000	150	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Carbon tetrachloride	0.5	0.5	74	370	430	0.5	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Chlorobenzene	10	10	960	4000	4600	10	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Chloroethane	25	120	6,400	10,000	10,000	25	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Chloroform	8	8	19	97	110	8	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Chloromethane	3	3	250	1200	1400	3	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Dibromochloromethane	8	8	17	82	95	8	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Dichlorodifluoromethane	100	100	1,900	8,000	9100	100	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,2-Dibromo-3-chloropropane	0.02	0.02	0.029	0.37	0.43	0.02	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,2-Dibromoethane (EDB)	0.005	0.005	0.74	3.7	4.3	0.005	mg/kg	<0.0016	<0.0019	<0.0014	<0.0013	<0.0024	<0.0020	<0.0021	<0.0020
1,2-Dichlorobenzene	60	60	3,800	10,000	10,000	60	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,3-Dichlorobenzene	61	61	10,000	10,000	10,000	61	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,4-Dichlorobenzene	10	10	40	200	230	10	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,1-Dichloroethane	3.1	16	280	1,400	1,600	3.1	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,2-Dichloroethane	0.5	0.5	17	86	98	0.5	mg/kg	<0.0016	<0.0019	<0.0014	<0.0013	<0.0024	<0.0020	<0.0021	<0.0020
1,1-Dichloroethene	0.7	0.7	3,800	10,000	10,000	0.7	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
cis-1,2-Dichloroethene	7	7	440	6,400	10,000	7	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
trans-1,2-Dichloroethene	10	10	1,100	4,800	5,500	10	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,2-Dichloropropane	0.5	0.5	45	220	260	0.5	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
cis-1,3-Dichloropropene	0.73	3.4	110	560	640	0.7	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
trans-1,3-Dichloropropene	0.73	3.4	110	560	640	0.7	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Ethylbenzene	70	70	180	890	1,000	70	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
2-Hexanone	6.3	26	570	2,400	2,800	6.3	mg/kg	<0.0080	<0.0094	<0.0069	<0.0064	<0.0119	<0.0102	<0.0105	<0.0098
Isopropylbenzene (Cumene)	600	2,500	7,700	10,000	10,000	600	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
4-Methyl-2-pentanone (MIBK)	330	930	10,000	10,000	10,000	330	mg/kg	<0.0080	<0.0094	<0.0069	<0.0064	<0.0119	<0.0102	<0.0105	<0.0098
Methylene Chloride	0.5	0.5	1,300	10,000	10,000	0.5	mg/kg	<0.0161	<0.0187	<0.0137	<0.0128	<0.0237	<0.0204	<0.0210	<0.0196
Methyl-tert-butyl ether	2	2	1,700	8,600	9,900	2	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Styrene	24	24	10,000	10,000	10,000	24	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,1,2,2-Tetrachloroethane	0.08	0.43	7.7	38	44	0.08	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Tetrachloroethene	0.5	0.5	770	3,200	3,600	0.5	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Toluene	100	100	10,000	10,000	10,000	100	mg/kg	<0.0040	<0.0047	0.0063	0.0043	0.0097	0.0109	0.0097	0.0067
1,2,4-Trichlorobenzene	27	27	610	3,100	10,000	27	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,1,1-Trichloroethane	20	20	10,000	10,000	10,000	20	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
1,1,2-Trichloroethane	0.5	0.5	4	16	18	0.5	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Trichloroethene	0.5	0.5	38	160	180	0.5	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Trichlorofluoromethane	200	200	10,000	10,000	10,000	200	mg/kg	<0.0040	<0.0047	<0.0034	<0.0032	<0.0059	<0.0051	<0.0053	<0.0049
Vinyl chloride	0.2	0.2	0.9	61	280	0.2	mg/kg	<0.0016	<0.0019	<0.0014	<0.0013	<0.0024	<0.0020	<0.0021	<0.0020
Xylene (Total)	1,000	1,000	1,900	8,000	9,100	1,000	mg/kg	<0.0080	<0.0094	<0.0069	<0.0064	<0.0119	<0.0102	<0.0105	<0.0098

Notes:

All analytical data reported in milligrams per kilogram (mg/kg), or parts per million.
SHS MSC - Statewide Health Standard Medium-Specific Concentration.
< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.
Shaded values exceed the applicable standard
NS - No Standard for Parameter

Table 7
Summary of Groundwater Quality Data - Metals
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Units	B-4-3	B-5-1
Aluminum	NS	NS	µg/L	9,500	17,000
Antimony	6	6	µg/L	<10	<10
Arsenic	10	10	µg/L	<8	<8
Barium	2,000	2,000	µg/L	183	299
Beryllium	4	4	µg/L	<2	<2
Cadmium	5	5	µg/L	<4	<4
Calcium	NS	NS	µg/L	91,400	205,000
Chromium	100	100	µg/L	13.8	11.7
Cobalt	13	35	µg/L	<10	24.1
Copper	1,000	1,000	µg/L	18.8	38.3
Iron	NS	NS	µg/L	11,600	18,100
Lead	5	5	µg/L	9.9	33.3
Magnesium	NS	NS	µg/L	31,900	56,600
Mercury	2	2	µg/L	<1	<1
Nickel	100	100	µg/L	<50	<50
Manganese	300	300	µg/L	322	865
Potassium	NS	NS	µg/L	4,360	10,300
Selenium	50	50	µg/L	<20	<20
Silver	100	100	µg/L	<4	<4
Sodium	NS	NS	µg/L	18,300	6,340
Thallium	2	2	µg/L	<20	<20
Vanadium	2.9	8.2	µg/L	28.7	32.9
Zinc	2,000	2,000	µg/L	39.1	138

Notes:

All analytical data reported in micrograms per liter (µg/L), or parts per billion.
SHS MSC - Statewide Health Standard Medium-Specific Concentration.
< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.
Shaded values exceed the applicable standard
NS - No applicable standard for paramater.
NA - Parameter not analyzed.

Table 8
Summary of Groundwater Quality Data - Polychlorinated Biphenyls
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Units	B-4-3	B-5-1
PCB-1016 (Aroclor 1016)	0.37	1.7	µg/L	<0.05	<0.05
PCB-1221 (Aroclor 1221)	0.37	1.7	µg/L	<0.05	<0.05
PCB-1232 (Aroclor 1232)	0.37	1.7	µg/L	<0.05	<0.05
PCB-1242 (Aroclor 1242)	0.37	1.7	µg/L	<0.05	<0.05
PCB-1248 (Aroclor 1248)	0.37	1.7	µg/L	<0.05	<0.05
PCB-1254 (Aroclor 1254)	0.37	1.7	µg/L	<0.05	<0.05
PCB-1260 (Aroclor 1260)	0.37	1.7	µg/L	<0.05	<0.05

Notes:

All analytical data reported in micrograms per liter (µg/L), or parts per billion.
SHS MSC - Statewide Health Standard Medium-Specific Concentration.
< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.
Shaded values exceed the applicable standard
NS - No applicable standard for paramater.
NA - Parameter not analyzed.

Table 9
Summary of Groundwater Quality Data - Polycyclic Aromatic Hydrocarbons
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Units	B-4-3	B-5-1
Acenaphthene	2,500	3,800	ug/L	<5.00	<5.00
Acenaphthylene	2,500	7,000	ug/L	<5.00	<5.00
Anthracene	66	66	ug/L	<5.00	<5.00
Benzo(a)anthracene	0.32	4.9	ug/L	<5.00	<5.00
Benzo(a)pyrene	0.2	0.2	ug/L	<5.00	<5.00
Benzo(b)fluoranthene	0.19	1.2	ug/L	<5.00	<5.00
Benzo(g,h,i)perylene	0.26	0.26	ug/L	<5.00	<5.00
Benzo(k)fluoranthene	0.19	0.55	ug/L	<5.00	<5.00
Chrysene	0.19	0.19	ug/L	<5.00	<5.00
Dibenz(a,h)anthracene	0.055	0.6	ug/L	<5.00	<5.00
Fluoranthene	260	260	ug/L	<5.00	<5.00
Fluorene	1,700	1,900	ug/L	<5.00	<5.00
Indeno(1,2,3-cd)pyrene	0.19	2.8	ug/L	<5.00	<5.00
Naphthalene	100	100	ug/L	<5.00	<5.00
Phenanthrene	1,100	1,100	ug/L	<5.00	<5.00
Pyrene	130	130	ug/L	<5.00	<5.00

Notes:

All analytical data reported in micrograms per liter (µg/L), or parts per billion.

SHS MSC - Statewide Health Standard Medium-Specific Concentration.

< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.

Shaded values exceed the applicable standard

NS - No applicable standard for paramater.

NA - Parameter not analyzed.

Table 10
Summary of Groundwater Quality Data - Volatile Organic Compounds
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, PA

Parameter	Residential SHS MSC	Non-Residential SHS MSC	Units	B-4-3	B-5-1
Acetone	38,000	110,000	ug/L	820	<10.0
Benzene	5	5	ug/L	<1.00	<1.00
Bromodichloromethane	80	80	ug/L	<1.00	<1.00
Bromoform	80	80	ug/L	<1.00	<1.00
Bromomethane	10	10	ug/L	<1.00	<1.00
2-Butanone (MEK)	4,000	4,000	ug/L	652	<10.0
Carbon disulfide	1,500	6,200	ug/L	<1.00	<1.00
Carbon tetrachloride	5	5	ug/L	<1.00	<1.00
Chlorobenzene	100	100	ug/L	<1.00	<1.00
Chloroethane	250	1,200	ug/L	<1.00	<1.00
Chloroform	80	80	ug/L	<1.00	<1.00
Chloromethane	30	30	ug/L	<1.00	<1.00
cis-1,2-Dichloroethene	70	70	ug/L	<1.00	<1.00
cis-1,3-Dichloropropene	7.3	34	ug/L	<1.00	<1.00
Dibromochloromethane	80	80	ug/L	<1.00	<1.00
1,2-Dibromo-3-chloropropane	0.2	0.2	ug/L	<5.00	<5.00
1,2-Dibromoethane (EDB)	0.05	0.05	ug/L	<1.00	<1.00
Dichlorodifluoromethane	1,000	1,000	ug/L	<1.00	<1.00
1,2-Dichlorobenzene	600	600	ug/L	<1.00	<1.00
1,3-Dichlorobenzene	600	600	ug/L	<1.00	<1.00
1,4-Dichlorobenzene	75	75	ug/L	<1.00	<1.00
1,1-Dichloroethane	31	160	ug/L	<1.00	<1.00
1,2-Dichloroethane	5	5	ug/L	<1.00	<1.00
1,1-Dichloroethene	7	7	ug/L	<1.00	<1.00
trans-1,2-Dichloroethene	100	100	ug/L	<1.00	<1.00
1,2-Dichloropropane	5	5	ug/L	<1.00	<1.00
trans-1,3-Dichloropropene	7	34	ug/L	<1.00	<1.00
Ethylbenzene	700	700	ug/L	<1.00	<1.00
2-Hexanone	63	260	ug/L	<10.0	<10.0
Isopropylbenzene (Cumene)	840	3,500	ug/L	<1.00	<1.00
4-Methyl-2-pentanone (MIBK)	3,300	9,300	ug/L	<10.0	<10.0
Methylene Chloride	5	5	ug/L	<1.00	<1.00
Methyl-tert-butyl ether	20	20	ug/L	<1.00	<1.00
Styrene	100	100	ug/L	<1.00	<1.00
1,1,2,2-Tetrachloroethane	0.84	4.3	ug/L	<1.00	<1.00
Tetrachloroethene	5	5	ug/L	<1.00	<1.00
Toluene	1,000	1,000	ug/L	<1.00	<1.00
1,2,4-Trichlorobenzene	70	70	ug/L	<1.00	<1.00
1,1,1-Trichloroethane	200	200	ug/L	<1.00	<1.00
1,1,2-Trichloroethane	5	5	ug/L	<1.00	<1.00
Trichloroethene	5	5	ug/L	<1.00	<1.00
Trichlorofluoromethane	2,000	2,000	ug/L	<1.00	<1.00
Vinyl chloride	2	2	ug/L	<1.00	<1.00
Xylene (Total)	10,000	10,000	ug/L	<2.00	<2.00

Notes:

All analytical data reported in micrograms per liter (µg/L), or parts per billion.
SHS MSC - Statewide Health Standard Medium-Specific Concentration.
< - Constituent not detected at the reporting limit noted, as provided in laboratory analytical reports.
Shaded values exceed the applicable standard
NS - No applicable standard for paramater.
NA - Parameter not analyzed.

By: RRJ 22-MAR-2021
Ck: AB 22-MAR-2021

Table 11
Preliminary Lateral Earth and LPile Parameters
ACAA Project Number 40G1-20, Runway 28 Safety Area Improvement Project at Allegheny County Airport (AGC)
Allegheny County, Pennsylvania

Soil/Rock Layer Description(1)	Lateral Earth Pressure Coefficients(2)		LPILE Lateral Load Parameters							
	At-Rest, Ko	Active, Ka	Lpile Soil Type for p-y Model	Effective Unit Weight (3) γ' (pcf)	Drained Friction Angle(4) ϕ' (deg)	Static k-Value for Sand k (pci)	Undrained Shear Strength Su (psf)	Static k-Value for Clay k (pci)	Strain E50	Rock Unconfined Compressive Strength q_u (psi)
Soil Within Frost Depth	0.58	-	Sand (Reese)	100	25	10	-	-	-	-
Exististing Rock Fragment and Clay Fill (Medium Dense)	0.47	0.46	Sand (Reese)	120 (Above W.T.) 62.6 (Below W.T.)	32	51 (Above W.T.) 36 (Below W.T.)	-	-	-	-
Completely Weathered Limestone (Medium Dense to Dense)	0.44	0.40	Sand (Reese)	130 (Above W.T.) 72.6 (Below W.T.)	34	77 (Above W.T.) 52 (Below W.T.)	-	-	-	-
Weathered Shale/Limestone (Very Dense)	0.41	0.36	Sand (Reese)	135 (Above W.T.) 77.6 (Below W.T.)	36	225 (Above W.T.) 125 (Below W.T.)	-	-	-	-
Claystone	-	-	Stiff Clay with/without Free Water	140 (Above W.T.) 82.6 (Below W.T.)	-	-	2000	500	0.007	-
Limestone	-	-	Strong Rock (Vuggy Limestone)	150 / 87.6	-	-	-	-	-	2500(5)

Notes:

(1)	Preliminary Lpile parameters are modeled after the subsurface profile observed at Boring B-9.
(2)	Earth pressure coefficients are determined by AASHTO (8th Edition, 2017) Section 3.11.5. The values are estimated for a 2H:1V backslope and a vertical wall face. Deviations from these conidtions will change the earth pressure coefficients.
(3)	Estimated based on laboratory test data and SPT blow count correlations and engineering judgment.
(4)	Effective friction angles are based on SPT blow count correlations and enigneering judgment.
(5)	Unconfined compressive strengths on selected rock samples were generally above 2500 psi, however, LPILE recommends 2500 psi as the upper limit for the Strong Rock model.

FIGURES

FIGURE 1 - Runway 28 EMAS

Figure 9: Runway 28 EMAS

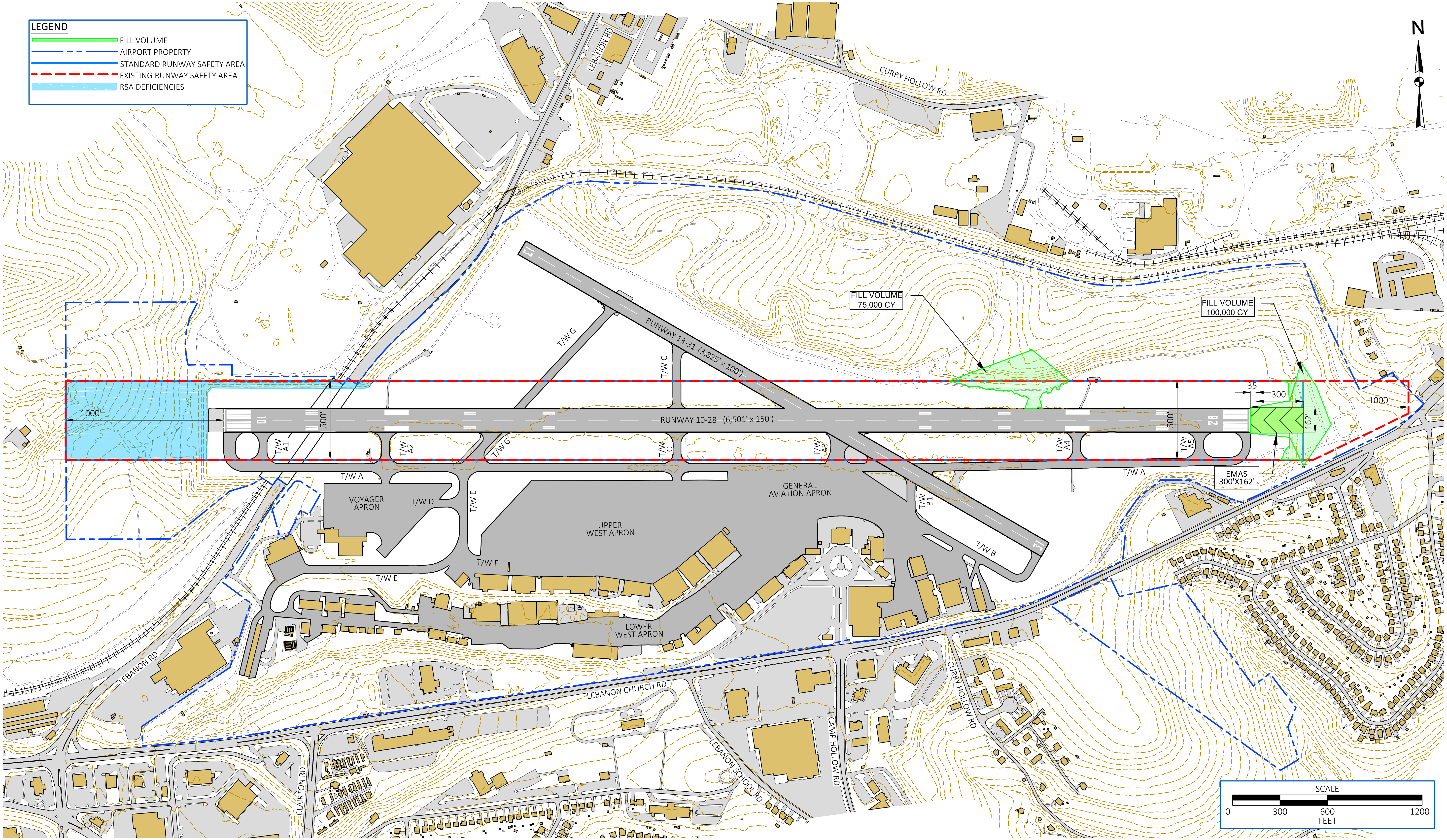
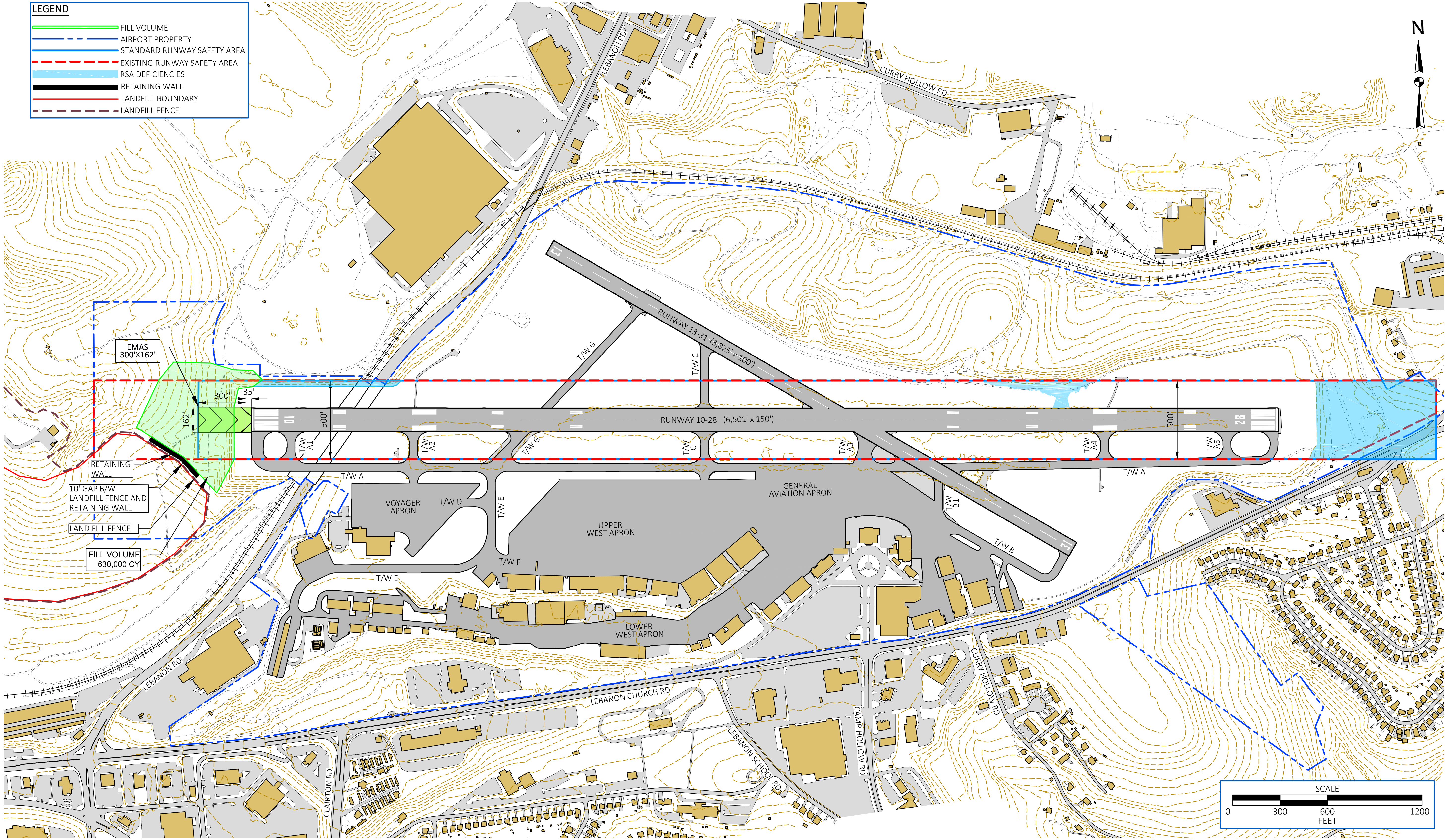


FIGURE 2 - Runway 10 EMAS with Wall

Figure 12: Runway 10 EMAS with Retaining Wall



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

GLASSPORT QUADRANGLE
PENNSYLVANIA
7.5-MINUTE SERIES

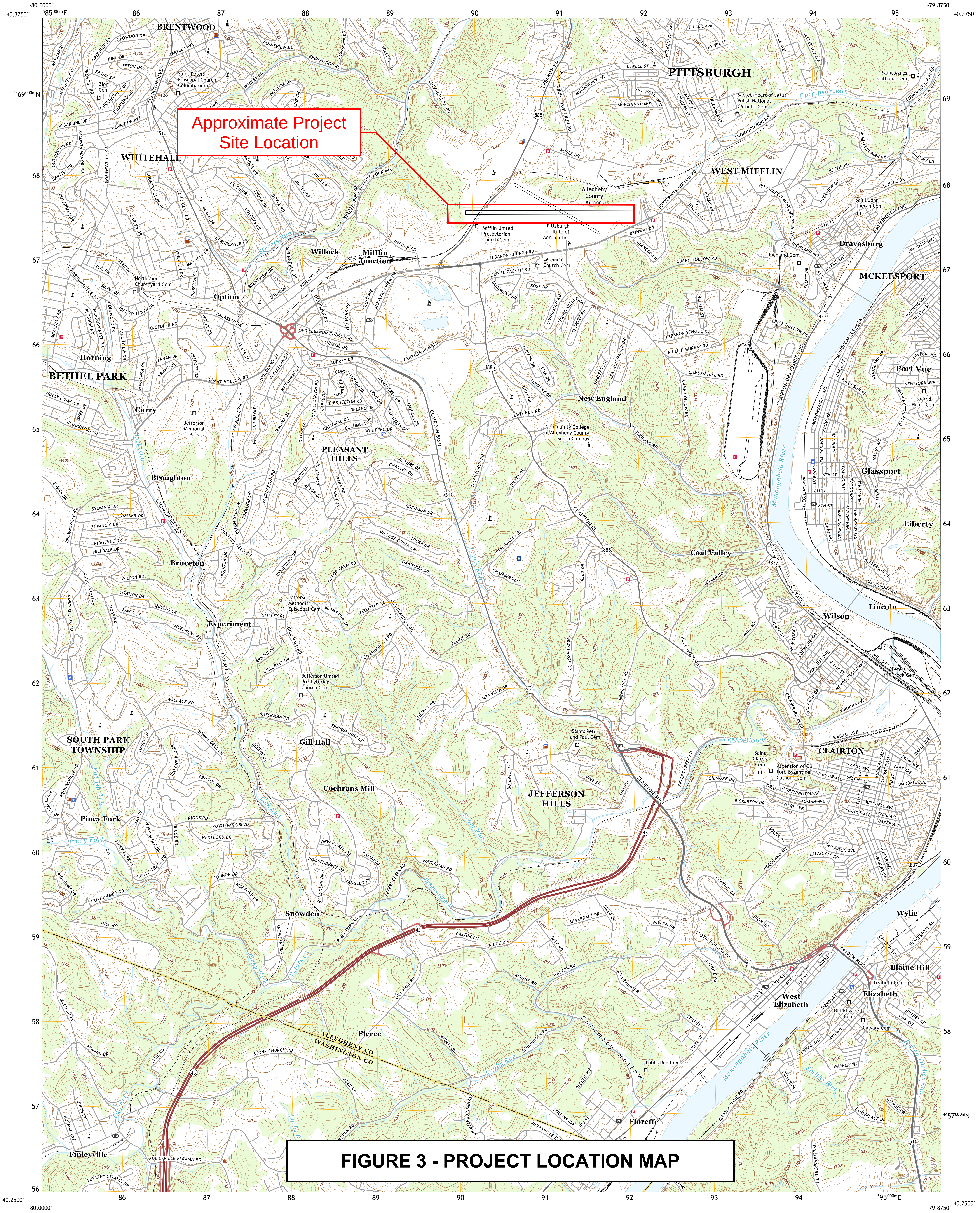


FIGURE 3 - PROJECT LOCATION MAP

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 17T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery..................NAIP, May 2017 - December 2017
Roads..................U.S. Census Bureau, 2016
Names..................GNIS, 1979 - 2019
Hydrography..................National Hydrography Dataset, 2000 - 2019
Contours..................National Elevation Dataset, 2010
Boundaries..............Multiple sources; see metadata file 2017 - 2018
Wetlands................FWS National Wetlands Inventory 1977

MN
GN
9°20´
166 MILS
0°41´
12 MILS

UTM GRID AND 2019 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
NE
Grid Zone Designation
17T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

PENNSYLVANIA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Pittsburgh West
2 Pittsburgh East
3 Braddock
4 Bridgeville
5 McKeesport
6 Hackett
7 Monongahela
8 Donora

ADJOINING QUADRANGLES

ROAD CLASSIFICATION

Expressway		Local Connector	
Secondary Hwy		Local Road	
Ramp		4WD	

Interstate Route
US Route
State Route

GLASSPORT, PA
2019

NSN. 7643016391433
NGA REF NO. USGSX24K17386

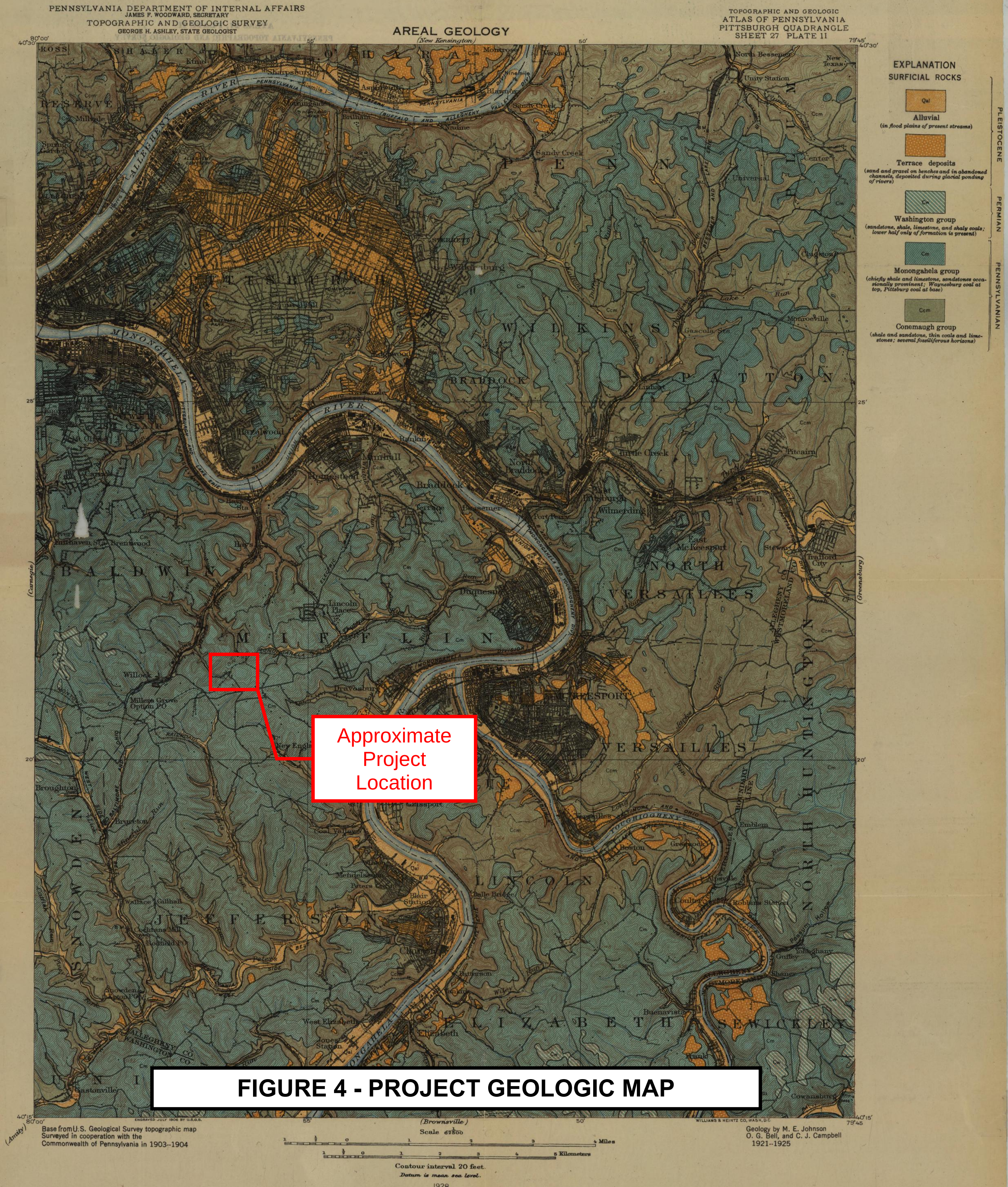


FIGURE 4 - PROJECT GEOLOGIC MAP

FIGURE 5 - PROJECT LANDSLIDE MAP

LANDSLIDES AND RELATED FEATURES

OF THE GLASSPORT, PA. QUADRANGLE

by
William E. Davies
1979

U.S. Geological Survey

OPEN FILE MAP 79-1314 (C-1)

Landslides and related features interpreted from aerial photographs:
1:12,000 (black and white) 1973

Photointerpretation and field check 1974
This map has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

■ **ACTIVE OR RECENTLY ACTIVE LANDSLIDE**
Complex landslide composed of earthflow, debris slide, earth and rock slump. Identified from historical records, and from scars, debris and other field evidence. Ground extremely unstable; sliding accelerated by excavation, loading and changes in drainage conditions. May include areas with several active slides too small to be shown separately. Questioned where doubtful.

OLD LANDSLIDE
Area of extensive hummocky ground caused by earthflow and earth and rock slump. Lacks clear evidence of active sliding. Relatively stable in natural, undisturbed state, generally not affected by small structures properly sited in areas away from the edge of the toe; can be reactivated by extensive, rapid excavation, loading, and changes in ground water and surface water conditions. Area of old landslide probably includes recent ones not identified from field evidence or otherwise documented. Upslope boundary of landslide generally defined by modified scarp, but downslope (toe) may be gradational and not well defined. Questioned where doubtful.

✚ **COMBINATION LANDSLIDE**
Area of recent and old slides in which individual slides are not identified.

V **COLLUVIAL SLOPE**
Valley wall along major streams with slope as steep as 40° (85%); stony, clayey silt soil up to 50 ft. (15 m) thick; commonly buttressed by a terrace or bench at the toe of the slope; very susceptible to sliding by cutting of toe area, removal of terrace or bench, and overloading; slide commonly activated without apparent cause.

ST **SCREE**
Residual accumulations of coarse rock material lying on quartzite slopes of the Valley and Ridge province. Generally stable except where subjected to extreme rainfall.

V **COLLUVIAL SLOPES WITH LANDSLIDES**
Landslides too small or obscure to map individually.

↓ **AREAS SUSCEPTIBLE TO DEBRIS FLOWS AND DEBRIS AVALANCHES**
Primarily shallow, narrow ravines and chutes with accumulation of stony colluvium generally 10 ft. (3 m) or less in thickness; susceptible to rapid movement during intense rainfall. Most ravines and chutes designated show evidence of former debris flows and avalanches. Symbol a designates historical debris flow or debris avalanche.

AREAS SUSCEPTIBLE TO ROCKFALL
Steep, locally vertical, natural and man-made slopes and cliffs, 15 ft. (4.5 m) or more high; formed dominantly of sandstone, limestone, sandy shale, mudstone and claystone. Interbedded mudstone, claystone and shale weather rapidly leaving sandstone and limestone rock faces unsupported.

▨ **SOIL AND ROCK SUSCEPTIBLE TO LANDSLIDING**
Soil and rock similar to that involved in landslides elsewhere in map area; primarily areas underlain by claystone, mudstone and shale associated with other rock types. Rock weathers rapidly on exposure forming clayey soil highly susceptible to sliding. Includes coves (U-shaped, shallow valleys) containing thick layers of clayey soil that are very susceptible to sliding where excavation breaks continuity of slope and where overloaded by artificial fill.

☐ **AREAS LEAST PRONE TO LANDSLIDES**
Map areas in which no patterns or symbols are shown; primarily valley floors, ridge tops and broad benches; modification by excavation and fill may lead to local landslides.
Includes slopes where landslides are sparse.

The first five digits of the open file number designate the specific 1:250,000 scale map sheet of which this quadrangle is a part. The last two digits designate the position of the quadrangle in a subdivision of the 1:250,000 scale map based on rows and tiers shown in the diagram to the right. The location of this quadrangle is shown by the black square.

NOTE

Information shown is intended as a general guide to ground conditions as of the date of field check. Additional landslides and rockfalls should be anticipated in all map units. The map unit depicts the dominant condition in the area delineated and variations in slope stability may occur at any point in the unit. This map is suitable for general planning purposes and as a supplement to more detailed studies for site selection. The map cannot be used as a substitute for detailed geologic and engineering investigations to establish design and construction criteria of specific sites. Some symbols may not appear on this map because the description is applicable to a series of maps.

MAN-MADE FEATURES

Strip mines (combination of letter symbols indicates complex formed of more than one type of strip mine)

sh	bench with high wall (In Allegheny County benches and furrows are shown by sh).
sf	furrowed with high wall
sd	multiple furrows and multiple benches
ss	hilltop removed
srg	reclaimed by grading
sru	reclaimed by secondary use
sh/r	regraded in part, high wall remains

Coal refuse banks

r	identified on aerial photographs; not classified in field check
rb	not burnt nor on fire
rbb	burnt
rbd	burning
rbs	sludge

Quarries

q	quarry site
qub	spoil bank, quarry waste

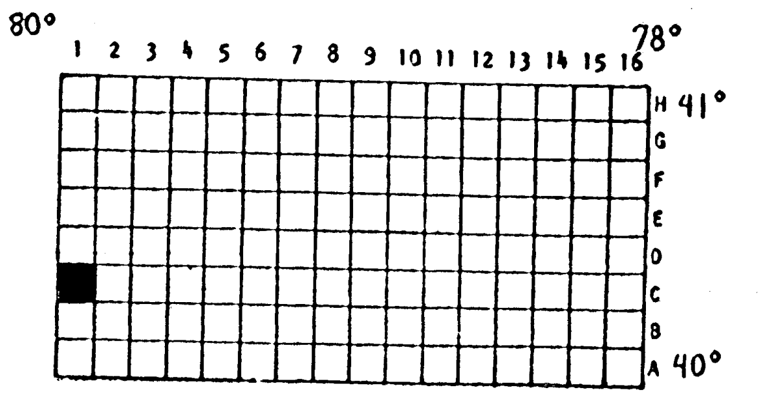
Gravel pits

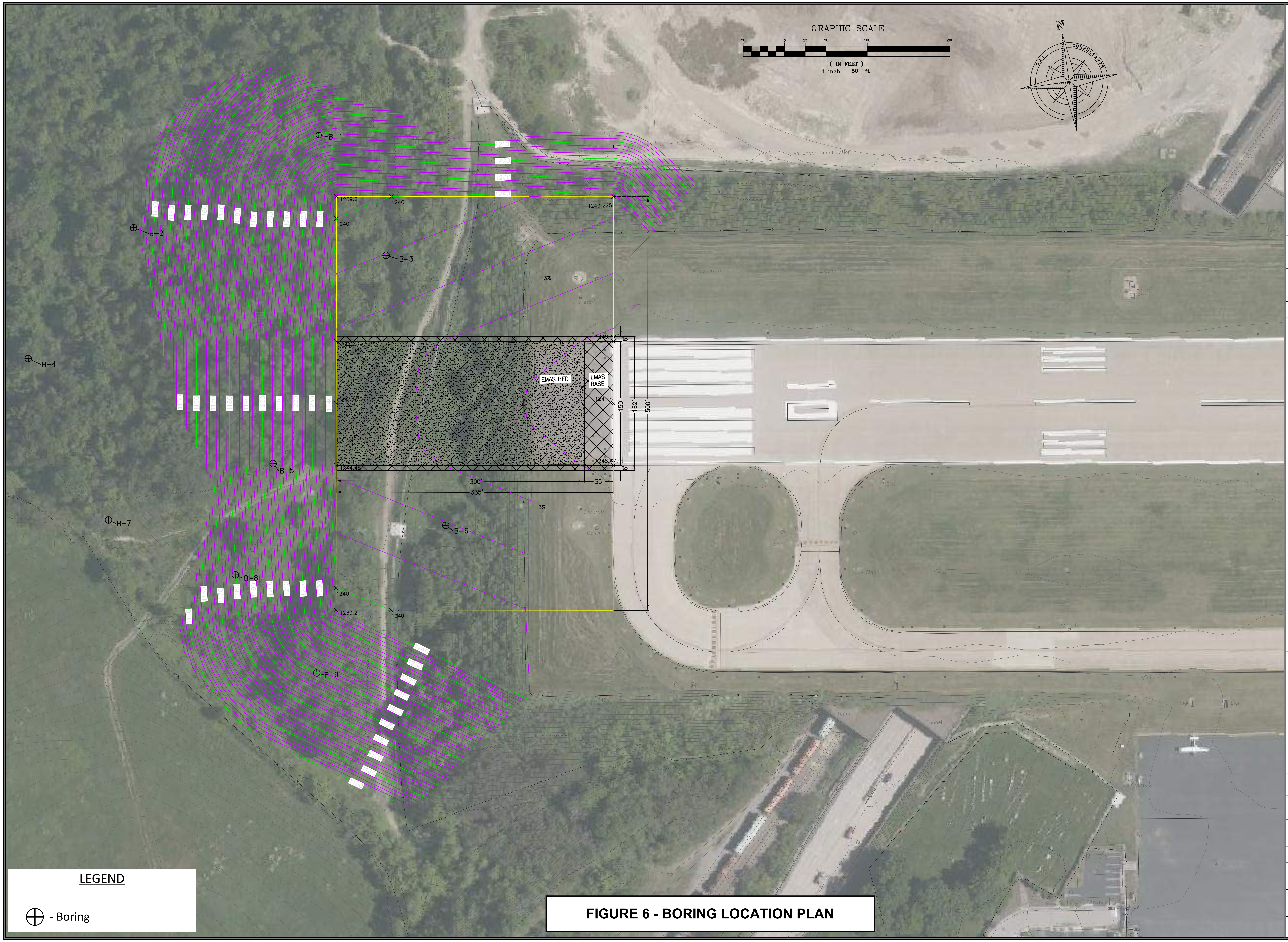
g	site of gravel pit

Slides in man-made features

af	earth flow in fill
a/s	earth flow in strip castings
a/r	earth flow in coal refuse

PITTSBURGH 1° X 2° SHEET





LEGEND

⊕ - Boring

FIGURE 6 - BORING LOCATION PLAN

NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:

REVISION RECORD

This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.

GAI CAD FILE PATH: Z:\Infra\2019\C191167.00 – ACAA RSA Improvements – E\CAD\Production Drawings\C191167.00–00–C–D1–2.dwg PLOTTED ON: 3/4/2021 11:41:59 AM PLOTTED BY: Cody Wood PLOT FILE: GAI.stb

DRAWING TITLE
RUNWAY 10 - 2 TO 1 SITE PLAN

CLIENT
ALEGENY COUNTY
AIRPORT

gai consultants

PROJECT
RUNWAY SAFETY AREA
IMPROVEMENT
ALLEGANY COUNTY
AIRPORT AUTHORITY

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

DRAWN BY:	CHECKED BY:	APPROVED BY:
WOODCA	WOLFEBR	WOLFEBR
DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	12/2/2020

SHEET NO.: 1 OF 1

REVISION △

GAI FILE NUMBER:
C191167.00-00-C-D1-2

ALT./CLIENT DRAWING NUMBER:

GAI DRAWING NUMBER:

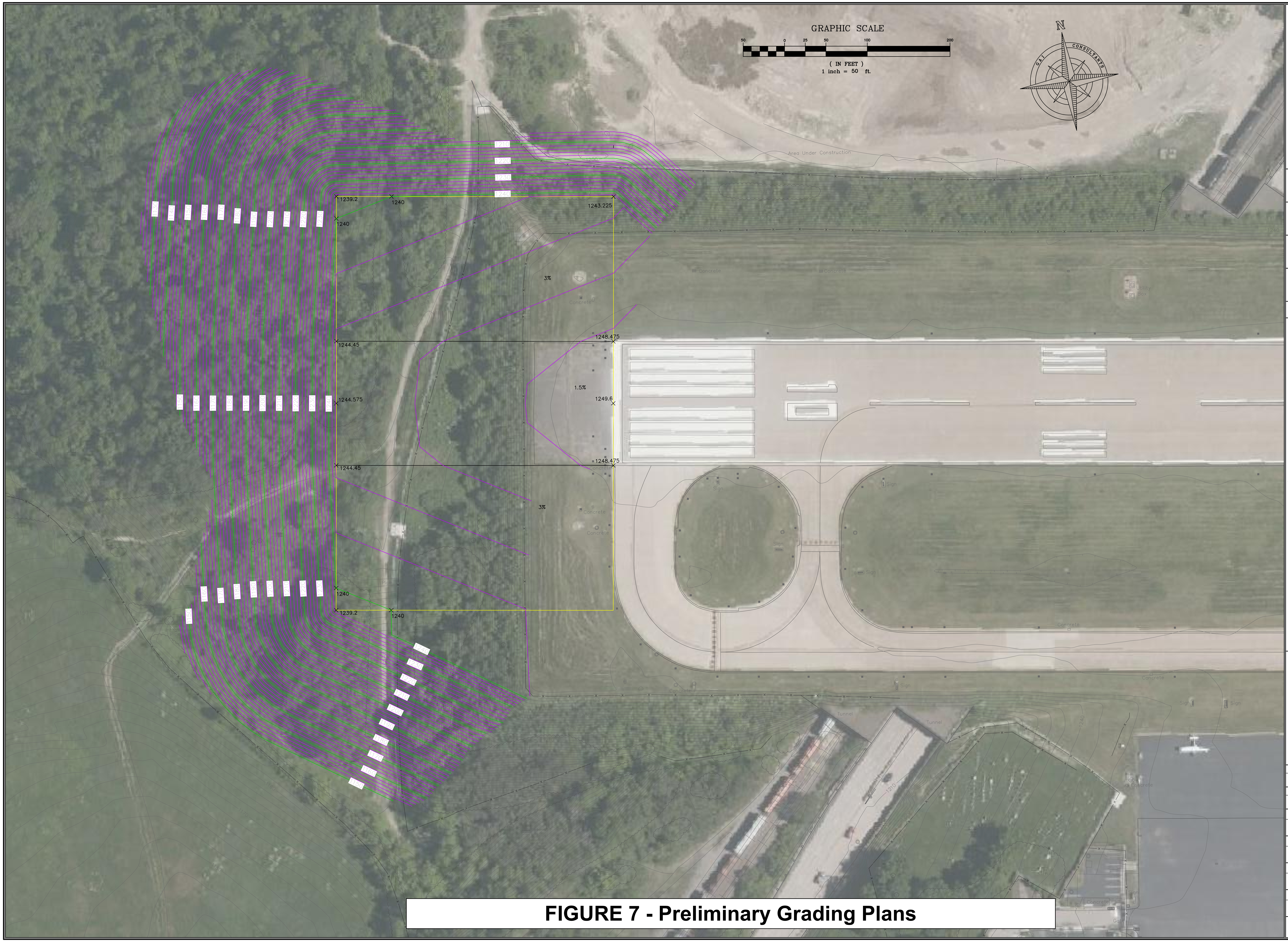


FIGURE 7 - Preliminary Grading Plans

NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:

REVISION RECORD

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DRAWING TITLE

RUNWAY 10 - 2 TO 1 SITE PLAN

PROJECT

**RUNWAY SAFETY AREA
IMPROVEMENT
ALLEGANY COUNTY
AIRPORT AUTHORITY**

gai consultants

CLIENT

**ALEGENY COUNTY
AIRPORT**

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

GAI CAD FILE PATH: Z:\Infra\2019\C191167.00 – ACAA RSA Improvements – E\CAD\Production Drawings\C191167.00-00-C-D1-2.dwg PLOTTED ON: 3/4/2021 11:41:59 AM PLOTTED BY: Cody Wood PLOT FILE: GAI.stb

DRAWN BY:	CHECKED BY:	APPROVED BY:
WOODCA	WOLFEBR	WOLFEBR
DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	12/2/2020

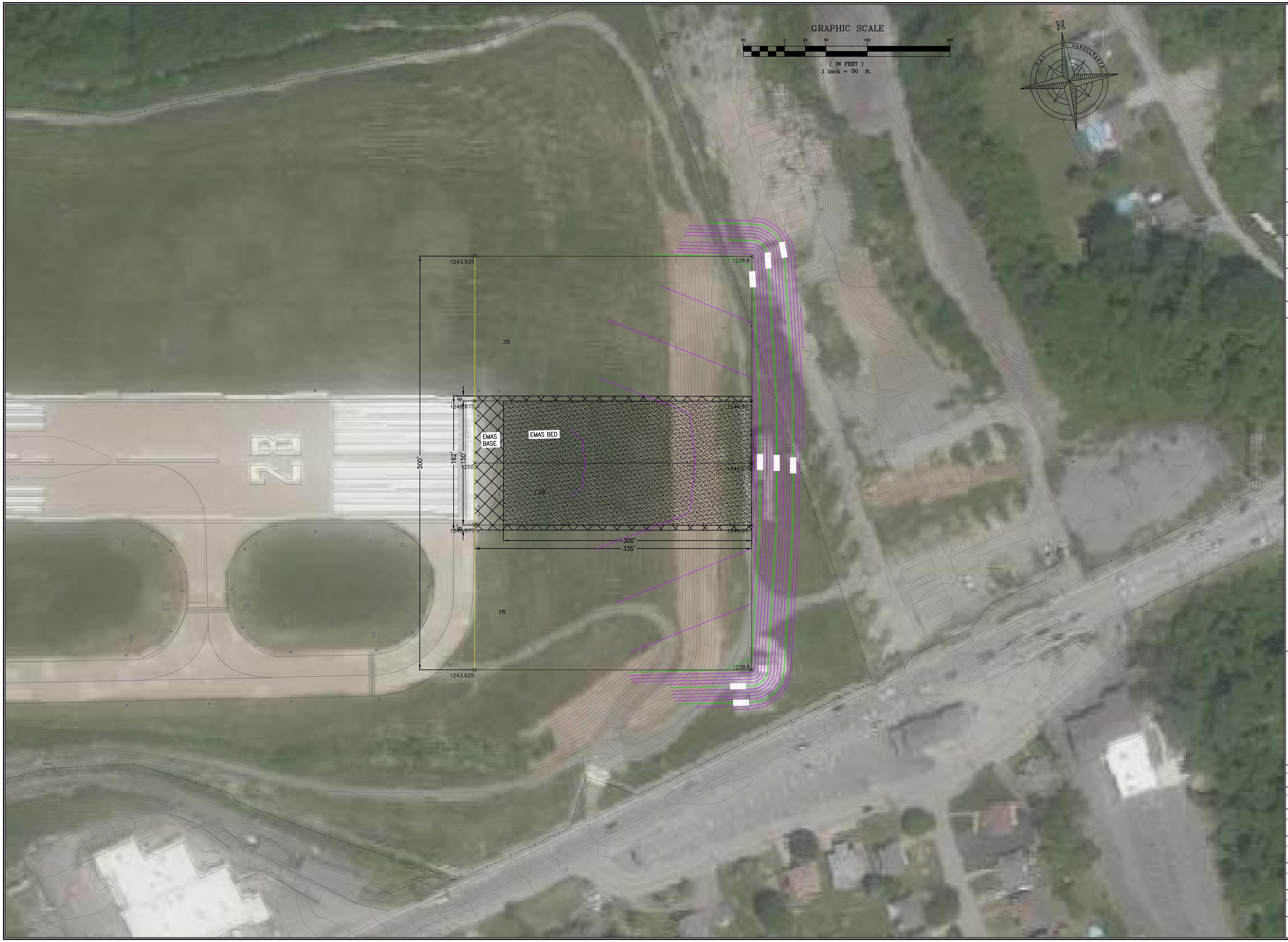
SHEET NO.: 1 OF 1

REVISION △

GAI FILE NUMBER:
C191167.00-00-C-D1-2

ALT./CLIENT DRAWING NUMBER:

GAI DRAWING NUMBER:



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REVISION RECORD

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DRAWING TITLE

RUNWAY 28 - 2 TO 1 SITE PLAN

PROJECT

RUNWAY SAFETY AREA
IMPROVEMENT
ALLEGANY COUNTY
AIRPORT AUTHORITY

gai consultants

CLIENT

ALEGENY COUNTY
AIRPORT

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

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DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	**12/2/2020**

SHEET NO.:
1 OF 1

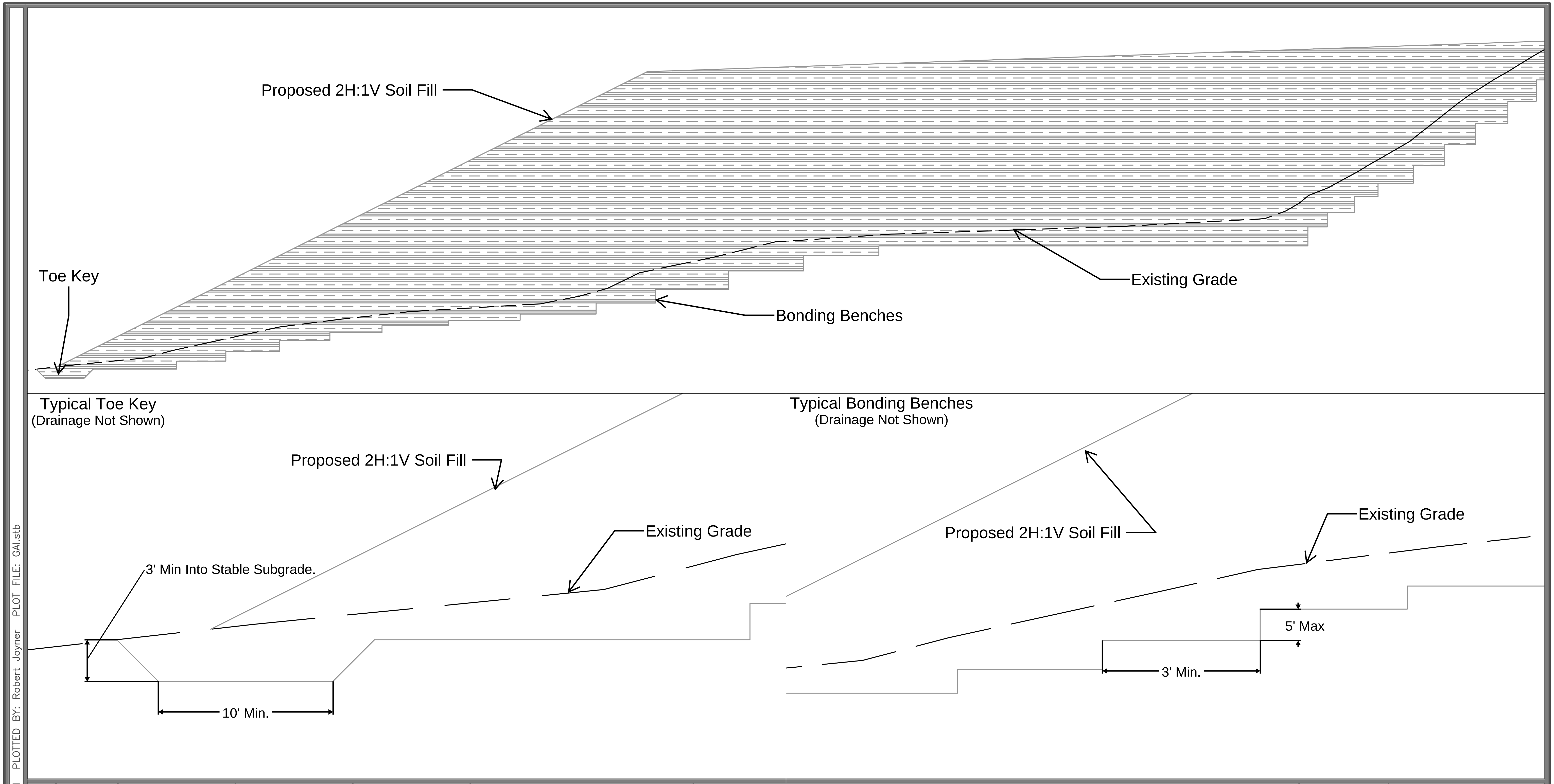
REVISION
△

GAI FILE NUMBER:
C191167.00-00-C-D1-2

ALT./CLIENT DRAWING NUMBER:

GAI DRAWING NUMBER:

FIGURE 8 - 2H:1V Fill Slope Conceptual Sketch



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DRAWING TITLE

PROJECT

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ISSUE DATE:

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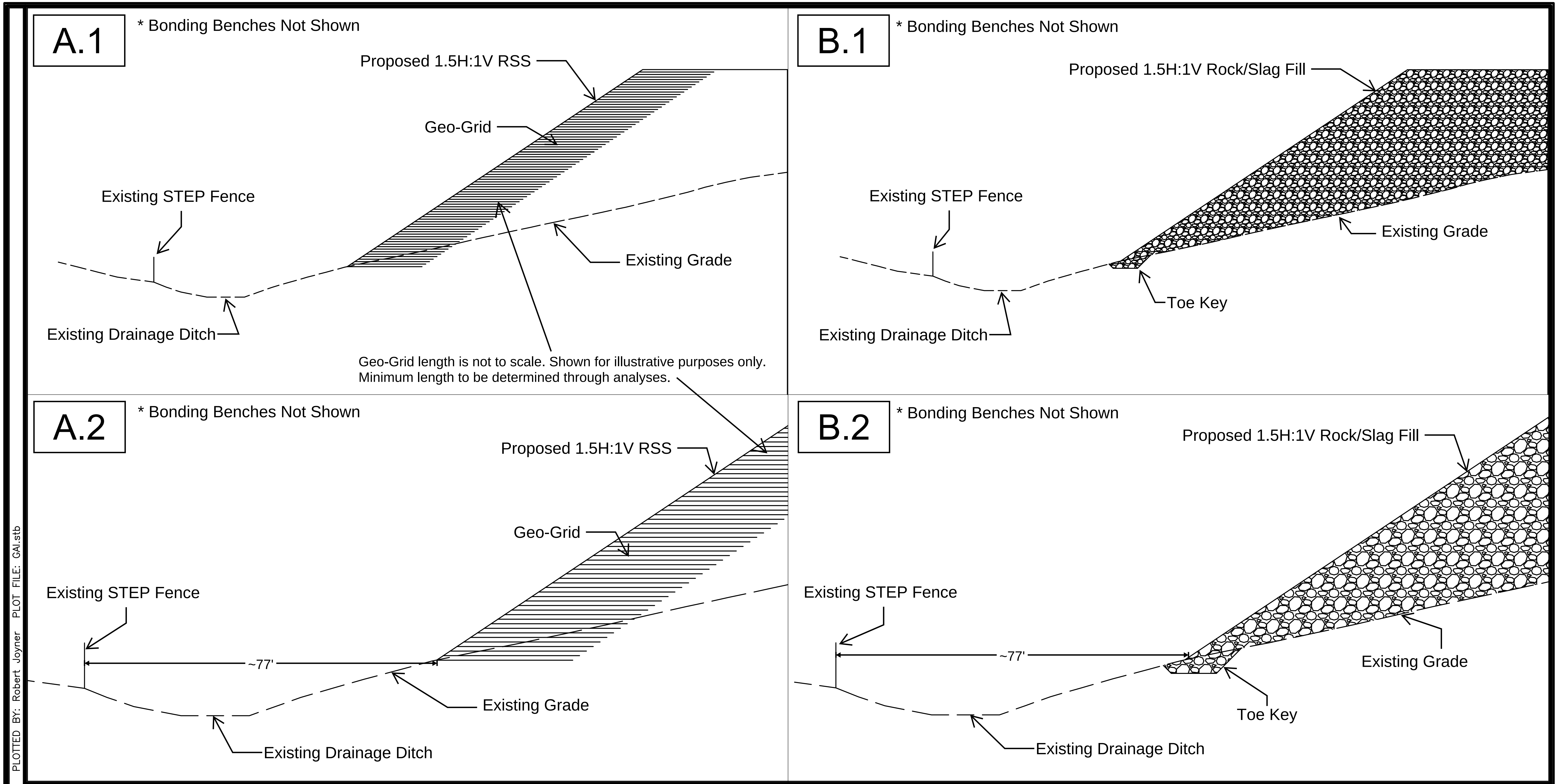
GAI FILE NUMBER: Sketches NO LABELS 21

GAI DRAWING NUMBER:

GAI CAD FILE PATH: C:\Users\joynerr\Desktop\New folder (7)\acaa\Sketches\Sketches NO LABELS 21.dwg

PLOTTED ON: 3/16/2021 8:48:02 AM PLOTTED BY: Robert Joyner PLOT FILE: GAI.stb

FIGURE 9 - 1.5H:1V Fill Slope Conceptual Sketch



NO.:	DATE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DESCRIPTION:

REVISION RECORD

DRAWING TITLE

PROJECT

gai consultants

CLIENT

ISSUE DATE:

DRAWN BY: **RRJ**

SCALE: **N.T.S**

CHECKED BY:

APPROVED BY:

REVISION

SHEET NO.: **1** OF **1**

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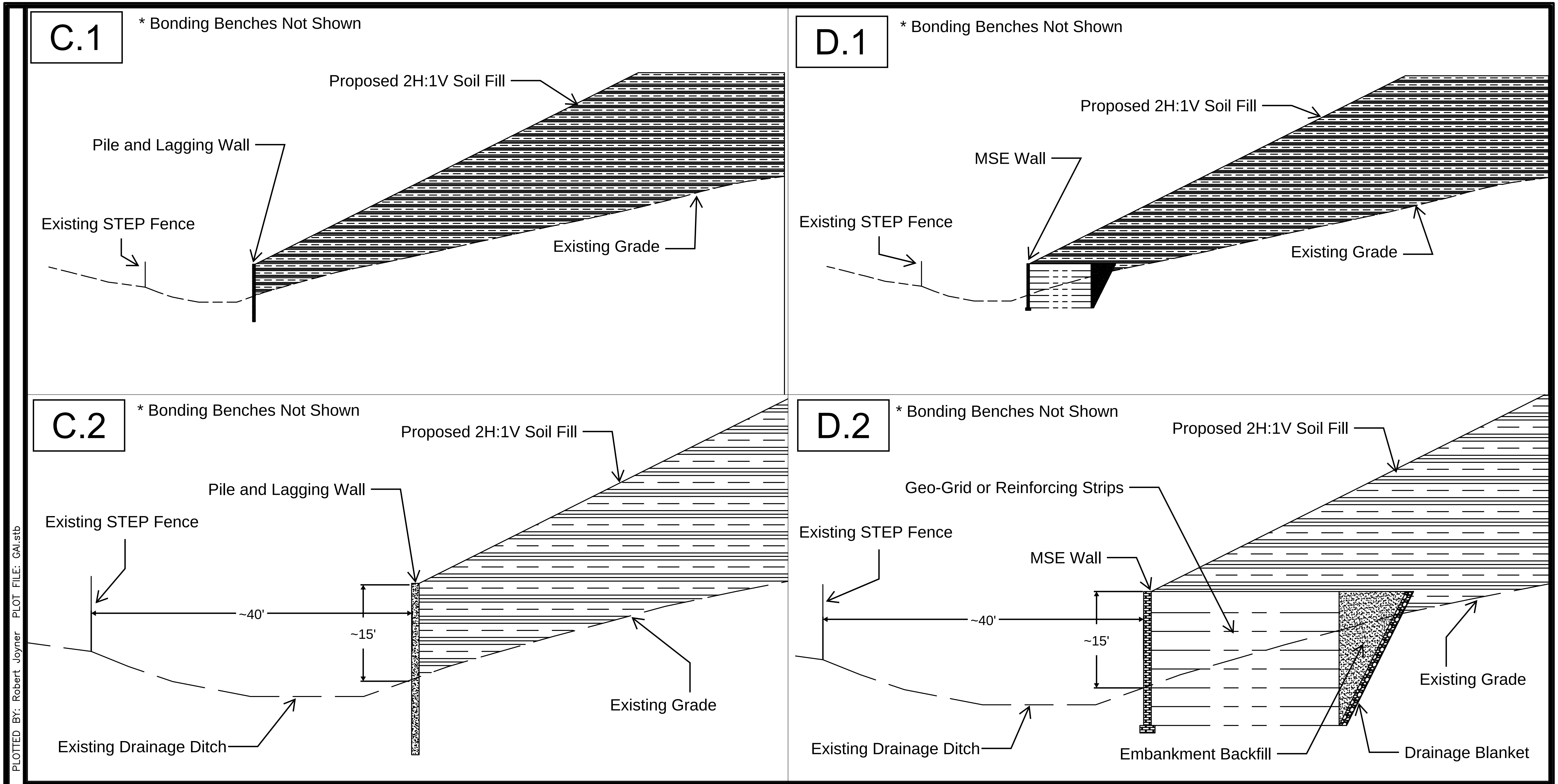
GAI FILE NUMBER: **Conceptual Sketches**

GAI DRAWING NUMBER:

GAI CAD FILE PATH: Z:\Infra\2019\C191167.00 – ACAA RSA Improvements – E\Working Docs\GEOTECH\GER\Cross Sections – Sketches\Conceptual Sketches.dwg

PLOTTED ON: 3/18/2021 9:21:10 AM PLOTTED BY: Robert Joyner PLOT FILE: GAI.stb

FIGURE 10 - 2H:1V Fill Slope and Retaining Wall Conceptual Sketch



NO.:	DATE:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DESCRIPTION:

REVISION RECORD

DRAWING TITLE

PROJECT

gai consultants

CLIENT

ISSUE DATE:

DRAWN BY: RRJ

SCALE: N.T.S

CHECKED BY:

APPROVED BY:

REVISION

SHEET NO.: 1 OF 1

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GAI FILE NUMBER: Sketches NO LABELS

GAI DRAWING NUMBER:

ISSUING OFFICE: Pittsburgh | 385 E. Waterfront Drive, Homestead, PA 15120

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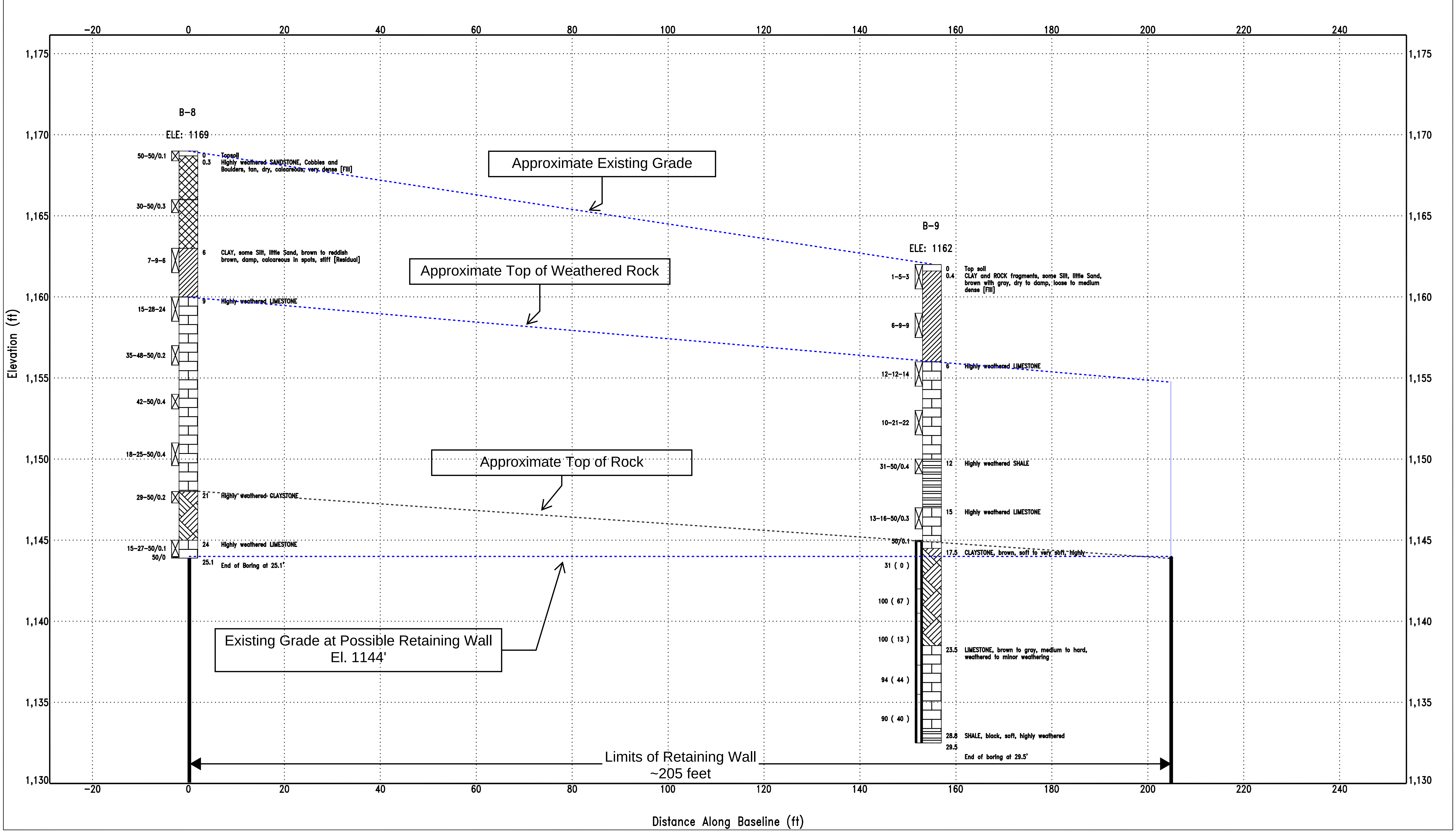
PLOTTED ON: 3/18/2021 8:44:24 AM PLOTTED BY: Robert Joyner PLOT FILE: GAI.stb

FIGURE 11 - Preliminary Retaining Wall Subsurface Profile

GAI Consultants

CLIENT ACAA
PROJECT NUMBER C191167.00
PROJECT NAME ACAA RSA Improvements
PROJECT LOCATION

- ▨ Fill (made ground)
- ▤ Limestone
- ▤ Shale
- ▨ Bedrock
- ▨ USCS Low Plasticity Clay



PHOTOGRAPHS

Photograph 1. Looking southwest at Boring B-6.

Photograph 2. Looking south at monitoring well installation at Boring B-5.

Photograph 3. Looking south at Boring B-7.

Photograph 4. Looking south at dozer clearing near Boring B-7.

APPENDIX A

Field Boring Logs

Sequence of Soil Description: Soil name, Color, Moisture, State (density or consistency), Structure, Supplemental descriptors and remarks, (Origin)

Table 3.6(b) - Descriptors for Coarse-Grained Material based on Grain Size

Coarse Grain Sizes			
	inches	mm	sieve
BOULDERS	> 12	>300	-
COBBLES	12 to 3	300 - 75	-
C GRAVEL	3 to $^3/_4$	75 - 19.0	-
GRAVEL	$^3/_4$ to $^3/_{16}$	19.0 - 4.75	-
SAND	$^3/_{16}$ to $^1/_{64}$	4.75 - 0.425	#4 to #40
F SAND	-	0.425 - 0.075	#40 to #200

Table 3.6(c) – Descriptors for Fine-Grained Materials Based on Behavior

Primary Descriptor		Rolled Thread Diameter	Estimated Plasticity Index (PI)	Plasticity Description	Physical Behavior	
Fine-Grained Soils	**SILT**	$^1/_4$ -inch	NP	Non-plastic (NP)	Dries rapidly when rolling	moist ball sheds water when shook
	CLAYEY SILT	$^1/_8$ -inch	< 10%	Low plasticity (LP)	Feels powdery when drying out during rolling	moist ball retains water when shook
	LEAN CLAY	$^1/_{16}$ -inch or less	>10% to 20%	Medium plasticity (MP)	Sticky when rolling	
	FAT CLAY	$^1/_{16}$ -inch or less	>20%	High plasticity (HP)	Very sticky when rolling. Greasy feel.	

COARSE-GRAINED SOILS have <50% passing the No. 200 sieve				
			Group Symbol	**Group Name**
Gravels <50% of coarse fraction passing the No. 4 sieve	Clean Gravel (<5% fines)	-	**GW**	**Well-graded GRAVEL**
		-	**GP**	**Poorly-graded GRAVEL**
	Gravels with Fines (>12% fines)	fines classify as ML or MH	**GM**	**SILTY GRAVEL**
		fines classify as CL or CH	**GC**	**CLAYEY GRAVEL**
Sands ≥50% of coarse fraction passing the No. 4 sieve	Clean Sands (<5% fines)	-	**SW**	**Well-graded SAND**
		-	**SP**	**Poorly-graded SAND**
	Sands with Fines (>12% fines)	fines classify as ML or MH	**SM**	**SILTY SAND**
		fines classify as CL or CH	**SC**	**CLAYEY SAND**

- In the UNIFIED system, a soil is considered coarse-grained if it contains fewer than 50% fines.
- Coarse-grained particles will not pass through a No.200 sieve.
- Gravel is material retained on the No.4 sieve.
- Sand is material passing the No.4 sieve but retained on the No. 200 sieve.
- Soil is classified as GRAVEL if the %-gravel is estimated to be greater than the %-sand.
- Soil is identified as SAND if the %-gravel is estimated to be equal to, or less than, the %-sand.

FINE-GRAINED SOILS have ≥50% passing the No. 200 sieve			
		Group Symbol	**Group Name**
Silts and Clays Liquid Limit <50	Inorganic	**CL**	**LEAN CLAY**
		ML	**SILT**
	Organic	**OL**	**ORGANIC SOIL**
Silts and Clays Liquid Limit <50	Inorganic	**CH**	**FAT CLAY**
		MH	**ELASTIC SILT**
	Organic	**OH**	**ORGANIC SOIL**

- In the UNIFIED system, a soil is considered to be fine-grained if it contains 50% or more fines.
- Particles that pass through a No. 200 sieve are identified as fine-grained.

Table 3.6(i) – Soil Structure Descriptors

Structure	Symbol	Description
stratified	Str	Alternating layers of varying material or color with layers at least ¼" thick: note thickness
laminated	Lam	Alternating layers of varying material or color with the layers less than ¼" thick, note thickness
fissured	Fis	Breaks along definite planes of fracture with little resistance to fracturing
slickensided	Slk	Fracture planes appear polished or glossy, sometimes striated
blocky	Blo	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
lensed	Len	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay, note thickness
homogeneous	Hom	Same color and appearance throughout

Origin Types:

Residual, Fill, Alluvium, Colluvium, etc.

Table 3.6(f) - Standard Moisture Descriptors

Descriptor	Symbol	Behavior
dry	Dr	absence of moisture, dusty, dry to the touch
damp	Da	slight moisture perceptible by touch, fine-grained soils are usually firm, granular soils usually have very little apparent cohesive binding
moist	M	no visible free water, sample cool to the touch, at or above optimum moisture, granular soil may exhibit slight apparent cohesive binding
wet	W	visible free water throughout sample, usually soil is below water table, contains significantly more moisture than moist soil, fine-grained soils usually soft or very soft, granular soils exhibit no apparent cohesive binding

Table 3.6(g) - Consistency of Cohesive Soils

Descriptor	Symbol	Typical Consistency	Est. Unconfined Compressive Strength - MPa (Tons/Sq. Ft.)
very soft	VS	Extruded between your fingers when squeezed	< 0.025 (0.25)
soft	S	Molded by light finger pressure	0.025 - 0.05 (0.25 - 0.5)
medium	M	Molded by strong finger pressure	0.05 - 0.1 (0.5 – 1)
stiff	St	Readily indented by thumbs but penetrated with great effort	0.1 - 0.2 (1 – 2)
very stiff	VSt	Readily indented by thumbnail	0.2 - 0.4 (2 – 4)
hard	H	Indented with difficulty by thumbnail	> 0.4 (4)

Table 3.6(h) - Relative Density of Granular Soils

Descriptor	Symbol	SPT-N60 (blows per ft.)
very loose	VL	0-4
loose	L	5-10
medium	M	11-30
dense	D	31-50
very dense	VD	over 50

Table 3.6(d) - Descriptors for Relative Amounts

Descriptor	Relative Amount (based on total sample volume)
trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

Examples of Soil Descriptions:

- Lean Clay, trace gravel, brown, stiff (Residual)
- Silty Sand, some gravel, brown, medium dense (Alluvium)

Note: USCS group symbol and moisture descriptor placed in log column.

Reference: PennDOT Pub 222 (2012)

Sequence of Rock Description: Rock Type, Color, Hardness, Weathering, Spacing of Bedding, Supplemental Descriptions, Fracture Dip Magnitude and Fracture Spacing.

Table 3.6(m) - Rock Hardness Descriptors

Descriptor and Symbol	Test Criteria for Hand Specimen	Typical PA Rock Type	Material with Comparable Hardness
Very Hard (VH)	not scratched by steel file	Sandstone, chert, schist, granite, gneiss, some limestone	steel file, window glass, porcelain,
Hard (H)	scratched by steel file	Siltstone, shale, most limestone	steel, concrete
Medium (M)	scratched by common steel nail		iron, nickel
Soft (S)	scratched by copper pipe or penny		PVC, fingernail
Very Soft (VS)	scratched by common hardwood dowel	Gypsum, evaporites, some shale	chalk

Table 3.6(n) - Rock Weathering Descriptors

Descriptor and Symbol	Criteria
Fresh (F)	No visible sign of decomposition or discoloration.
Minor Weathering (M)	**< 10% of rock mass has some degree of decomposition.** Slight discoloration inwards towards open fractures.
Weathered (W)	**10%-50% of rock mass has some degree of decomposition.** Significant portions of rock show discoloration. Weaker minerals such as feldspar decomposed. Apparent strength less than fresh parent rock.
Highly Weathered (H)	**> 50% of rock mass has some degree of decomposition.** Rock is significantly weakened relative to its un-weathered state. Less weathered core stones may be present in rock mass. Most rock types, when highly weathered, can be broken by hand or shaved with knife.

Table 3.6(o) – Spacing of Bedding and Discontinuities

Description for Bedding	**Spacing**	**Description for Joints or Fractures**
Massive (M)	> 3 m (10 feet)	Massive (M)
Very Thick (VTk)	1-3 m (3-10 feet)	Very Wide (Vw)
Thick (Tk)	0.3-1 m (1-3 feet)	Wide (Wi)
Medium (M)	50-300 mm (2-12 inches)	Medium (M)
Thin (Tn)	12-50 mm (½ - 2 inches)	Close (Cl)
Laminated (La)	< 12 mm (½ inch)	Laminated (La)

* If bedding is indistinct or not apparent, note as such.

Table 3.6(p) - Descriptors for Dip Magnitude

Dip Descriptor	**Dip Magnitude**
Very Steep (VStD)	>60° to 90°
Steep (StD)	>45° to 60°
Moderate (MoD)	>15° to 45°
Shallow (ShD)	>5° to 15°
Flat (FlD)	0° to 5°

Reference: PennDOT Pub 222 (2012)

Examples:
Shale, brown, medium hard, weathered, thin bedded, flat close fractures.

Limestone, gray, hard, fresh, bedding not apparent, vuggy, steep wide spaced fractures.

Sandstone, brown, hard, minor weathering, medium bedded, iron stained, shallow medium spaced fractures.

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FIELD BORING LOG

BORING NO. **B-1**
SHEET **1** OF **2**
DATE: START **2/25/21**
END **2/25/21**
Approx.ELEV. **1162**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.355173** LONG. **-79.942382**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: TIME: DATE:
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: TIME: DATE:
NOT ENCOUNTERED ☒

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	2 3 12	1.0'	-	1.5	cl	Damp	0.3 Topsoil 1161.7 LEAN CLAY and ROCK fragments, little Sand, brown, damp, stiff to very stiff [Fill]	
3.0									
4.5	S-2	5 6 12	1.5'	-	2.0	cl	Damp	- Cobbles	
6.0									
7.5	S-3	7 6 6	1.5'	-	2.0	CL	Damp		
9.0									Auger hitting cobbles/boulders
10.5	S-4	5 6 6	0.5'	-	1.5	cl	Damp	- color change to black/dark brown	S-4 spoon blocked off
12.0									
13.4	S-5	12 25 50/0.4	1.4'	-		-	Dry	12.0 1150.0 Highly weathered CLAYSTONE, tan, dry, calcareous in areas, very dense [Residual]	
15.0									
16.4	S-6	14 26 50/0.4	1.4'	-		-	Dry		
18.0									
19.2	S-7	14 30 50/0.2	1.2'	-		-	Dry		

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. **B-1**
SHEET **2** OF **2**
DATE: START **2/25/21**
END **2/25/21**
Approx.ELEV. **1162**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.355173** LONG. **-79.942382**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ____ ; DEPTH: ____ ; WATER: DEPTH: ____ TIME: ____ DATE: ____
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED ☒

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
21.0								Highly weathered CLAYSTONE, tan, dry, calcareous in areas, very dense [Residual] *(continued)* gravel sized limestone fragments on top of Claystone. Likely a small seam prior to sample	
22.5	S-8	10 17 40	1.5'	-		-	Dry		
24.0								24.0 1138.0	
24.1	S-9	50/0.1	0.1'	-		-	Dry	24.1 Highly weathered LIMESTONE, gray, dry, very dense [Residual] 1137.9 End of Boring at 24.1' upon spoon refusal. Backfilled with auger cuttings.	Temporary piezometer installed for 24-hr water level readings

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. **B-2**
SHEET **1** OF **2**
DATE: START **2/25/21**
END **2/25/21**
Approx.ELEV. **1124**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.354864** LONG. **-79.943184**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: **14.2'** TIME: **0-HR** DATE: **2/25/21**
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: **7.6'** TIME: **24-HR** DATE: **2/26/21**
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	1 2 5	1.5'	-	1.5	cl	Damp	0.3 Topsoil 1123.7 LEAN CLAY with Sand and ROCK fragments (Decomposed Shale), light brown, red oxidation on rock fragment surfaces, damp to moist, stiff to very stiff [Residual]	
3.0									
4.5	S-2	2 6 7	1.5'	-	2.5	CL	Damp		
6.0									
7.5	S-3	4 4 7	1.5'	-	2.0	cl	Moist		
9.0								- increase in water content. Little free water in spots	
10.5	S-4	6 9 10	1.5'	-		-	Moist	9.0 1115.0 Highly weathered SHALE, brown to reddish brown, moist to wet, medium dense [Residual]	
12.0									
13.5	S-5	4 6 6	1.5'	-		-	Wet	- free water in spoon, wet sample	
15.0									
16.2	S-6	25 48 50/0.2	1.2'	-		-	Wet	15.0 1109.0 Highly weathered LIMESTONE gray, wet, dense to very dense [Residual]	
18.0									
19.5	S-7	10 17 30	1.5'	-		-	Wet		

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FIELD BORING LOG

BORING NO. **B-2**
SHEET **2** OF **2**
DATE: START **2/25/21**
END **2/25/21**
Approx.ELEV. **1124**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.354864** LONG. **-79.943184**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: **14.2'** TIME: **0-HR** DATE: **2/25/21**
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: **7.6'** TIME: **24-HR** DATE: **2/26/21**
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
								Highly weathered LIMESTONE gray, wet, dense to very dense [Residual] *(continued)*	
21.0 21.3	S-8	50/0.3	0.3'	-		-	Wet	21.3 1102.7	Temporary piezometer installed for 24-hr water level readings
								End of Boring at 21.3' upon spoon refusal. Backfilled with auger cuttings.	

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. B-3
SHEET 1 OF 1
DATE: START 2/19/21
END 2/19/21
Approx.ELEV. 1198

PROJECT NAME ACAA RSA Improvements
PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA
LAT. 40.35466
LONG. -79.94189
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing
CASING: SIZE: ; DEPTH: ;
WATER: DEPTH: TIME: DATE:
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21
DEPTH: TIME: DATE:
NOT ENCOUNTERED ☒

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	4 4 14	1.2'	-		gc	Damp	Sandy LEAN CLAY and Surface slag GRAVEL/BOULDERS, gray and brown, medium dense [Fill]	Boring moved up slope ~40' to avoid utilities/thick brush S-1 1.5 ppm on PID
								- Boulder 2.0' to 5.5'	
3.0 3.7	S-2	10 50/0.2	0.5'	-		CL	Damp		
6.0 6.4	S-3	50/0.4	0.4'	-		-	Dry	6.0 1192.0 Highly weathered Sandy SHALE, gray and tan, very dense [Residual]	Difficult advancement
9.0 9.2	S-4	50/0.2	0.2'			-	Dry	9.2 1188.8 End of Boring at 9.2' upon spoon refusal. Backfilled with auger cuttings.	PID reading taken down augers at end of boring: 4.5 ppm

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. B-4
SHEET 1 OF 2
DATE: START 2/24/21
END 2/24/21
Approx.ELEV. 1118

PROJECT NAME ACAA RSA Improvements PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA LAT. 40.354429 LONG. -79.94364
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: Dry TIME: 0-HR DATE: 2/24/21
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21 DEPTH: 13.4' TIME: 24-HR DATE: 2/25/21
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	2 2 4	1.5'		1.0	cl	Moist	0.4 Top Soil 1117.6 Sandy LEAN CLAY, little Rock fragments (Sandstone), brown, damp to moist, stiff to very stiff [Fill]	Ground is saturated from snow melt Environmental sample taken at S-1
3.0									
3.0 4.5	S-2	5 8 8	1.5'		3.0	CL	Damp	- increase in Rock fragments	
6.0									Easy auger advancement
6.0 7.5	S-3	6 9 9	1.0'		2.5	cl	Damp	6.0 1112.0 CLAY, some Silt, little Sand, brown, dry to damp, stiff to very stiff [Residual]	
9.0									
9.0 10.5	S-4	5 6 6	1.0'		2.0	cl	Dry		
12.0									
12.0 13.5	S-5	15 19 21	1.5'		-	-	Dry	12.0 1106.0 Highly weathered LIMESTONE, gray and tan, dry, calcareous, dense to very dense [Residual]	
15.0									
15.0 16.5	S-6	20 34 39	1.5'		-	-	Dry		
18.0									
18.0 18.8	S-7	23 50/0.3	0.8'		-	-	Dry	- more gray	

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. **B-4**
SHEET **2** OF **2**
DATE: START **2/24/21**
END **2/24/21**
Approx.ELEV. **1118**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.354429** LONG. **-79.94364**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: **Dry** TIME: **0-HR** DATE: **2/24/21**
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: **13.4'** TIME: **24-HR** DATE: **2/25/21**
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
21.0								Highly weathered LIMESTONE, gray and tan, dry, calcareous, dense to very dense [Residual] *(continued)* 21.0 1097.0	
21.8	S-8	18 50/0.3	0.8'	-		-	Dry	Highly weathered SHALE, gray, dry, calcareous in spots, very dense [Residual]	Environmental sample taken at S-8
24.0									
24.3	S-9	50/0.3	0.0'	-	-	-	-	24.3 1093.7 End of Boring at 24.3' upon spoon refusal. Backfilled with auger cuttings.	Temporary piezometer installed for 24-hr water level readings

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

FIELD BORING LOG

BORING NO. B-5
SHEET 1 OF 2
DATE: START 2/22/21
END 2/22/21
Approx.ELEV. 1174

PROJECT NAME ACAA RSA Improvements PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA LAT. 40.354082 LONG. -79.942577
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: Dry TIME: 0-HR DATE: 2/22/21
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21 DEPTH: 10.9' TIME: 144-HR DATE: 2/23/21
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	2 4 9	1.5'	-	1.5	cl	Damp	FAT CLAY, little Sand, trace root fragments, trace Slag fragments, brown to reddish brown, dry to damp, stiff [0.0 - 1.0 Fill] [Residual] - lack of slag fragments	
3.0 4.5	S-2	3 4 8	1.5'	-	1.5	CH	Damp	- lack of root fragments	
6.0 7.5	S-3	7 5 24	1.5'	-	1.5	cl	Dry		
								9.0 1165.0	
9.0 10.5	S-4	8 11 16	1.5'	-		-	Dry	Highly weathered CLAYSTONE, tan, dry, medium dense [Residual]	
								12.0 1162.0	
12.0 13.3	S-5	28 21 50/0.3	1.3'	-		-	Dry	Highly weathered Sandy SHALE, gray, dry, very dense [Residual]	
								15.0 1159.0	
15.0 15.8	S-6	24 50/0.3	0.8'	-		-	Dry	Highly weathered alternating layers of CLAYSTONE, SILTSTONE, and Sandy SHALE, tan to gray, very dense [Residual]	
18.0 19.5	S-7	18 36 25	1.0'	-		-	Dry	19.5 1154.5	

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FIELD BORING LOG

BORING NO. B-5
SHEET 2 OF 2
DATE: START 2/22/21
END 2/22/21
Approx.ELEV. 1174

PROJECT NAME ACAA RSA Improvements
PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA
LAT. 40.354082
LONG. -79.942577
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing
CASING: SIZE: ; DEPTH: ;
WATER: DEPTH: Dry TIME: 0-HR DATE: 2/22/21
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21
DEPTH: 10.9' TIME: 144-HR DATE: 2/23/21
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
								Highly weathered CLAYSTONE, tan, dry, fissured, very dense [Residual] *(continued)*	
21.0	S-8	11 28 50	1.5'	-		-	Dry		
22.5									
24.0									
24.2	S-9	50/0.2	0.0'	-		-	Dry	24.2 1149.8 End of Boring at 24.2' upon rock core completion.	Boring converted to long term monitoring well

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. **B-6**
SHEET **1** OF **1**
DATE: START **2/19/21**
END **2/19/21**
Approx.ELEV. **1200**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.353879** LONG. **-79.941827**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: TIME: DATE:
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: TIME: DATE:
NOT ENCOUNTERED ☒

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	1 2 12	1.5'	-	1.5	cl	Moist	0.3 Topsoil 1199.7 CLAY and SILT, little Sand, brown, moist, medium to stiff, homogeneous [Residual]	Surface is snow covered ~7"
3.0									Auger to S-2 was slighly difficult
4.5	S-2	20 36 36	1.0'	-		-	Dry	3.5 1196.5 Highly weathered SILTSTONE, grading into highly weathered Shale, sandy in areas and with brown Clay in some fractures, brown with gray, very dense [Residual]	
6.0 6.9	S-3	50 50/0.4	0.9'	-		-	Dry		Difficult advancement
9.0 9.2	S-4	50/0.2	0.2'			-	Dry	9.2 1190.8 End of Boring at 9.2' upon spoon refusal. Boring backfilled with auger cuttings	

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. **B-7**
SHEET **1** OF **2**
DATE: START **2/26/21**
END **2/26/21**
Approx.ELEV. **1140**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.353894** LONG. **-79.94329**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing and NQ2 Wireline**
CASING: SIZE: ______ ; DEPTH: ______ ; WATER: DEPTH: **Dry** TIME: **Pre-Core** DATE: **2/26/21**
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: **18.2'** TIME: **24-HR** DATE: **2/27/21**
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	1 2 8	0.4'	-		gc	Dry	0.2 Topsoil 1139.8 LIMESTONE fragments, some Clay, gray and brown, dry, medium dense [Residual]	Very difficult to set augers Limestone fragments 1" nominal
3.0				-		-	-	3.0 1137.0	
4.5	S-2	12 18 19	1.5'	-	3.0	CL	Damp	Sandy LEAN CLAY with Gravel, (decomposed Claystone), tan, damp, calcareous, very stiff [Residual]	Environmental sample taken at S-2: 1.5 ppm
6.0				-		-	-		
7.5	S-3	12 27 42	1.5'	-	3.5	cl	Damp		Environmental sample taken at S-3: 6.5 ppm Slow advancement
9.0				-		-	-	9.0 1131.0	
9.1	S-4	50/0.1	0.1'	-		-	Dry	9.1 LIMESTONE, gray, dry, very dense [Residual] 1130.9	
11.5	R-1	-	2.4'	100 54	-	-	-	LIMESTONE, gray, hard, minor weathering, bedding not apparent, medium spaced fractures, flat relative dip 10.0 1130.0 10.3 1129.7 SHALE, dark gray, medium hard, weathered, laminated bedding, flat relative dip, thinly spaced fractures, flat relative dip	
14.0	R-2	-	0.6'	24 0	-	-	-	LIMESTONE with medium spaced thin Clay seams, tan and brown, medium hard to soft, highly weathered, bedding not apparent, closely spaced fractures, flat to very steep relative dip	Very broken at 11.1' to 11.6' Water loss at 11.4'
16.5	R-3	-	1.9'	76 24	-	-	-	15.2 1124.8 CLAYSTONE, gray, soft to very soft, highly weathered bedding not apparent, medium spaced fractures, shallow relative dip	
18.5	R-4	-	2.0'	100 45	-	-	-	18.5 1121.5	Very broken at 17.1' to 17.8'
				87		-	-	SHALE, black to dark gray, medium hard to soft, highly weathered, thin to laminated bedding, flat relative dip, closely spaced fractures, flat relative dip	

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. B-7
SHEET 2 OF 2
DATE: START 2/26/21
END 2/26/21
Approx.ELEV. 1140

PROJECT NAME ACAA RSA Improvements PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA LAT. 40.353894 LONG. -79.94329
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing and NQ2 Wireline
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: Dry TIME: Pre-Core DATE: 2/26/21
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21 DEPTH: 18.2' TIME: 24-HR DATE: 2/27/21
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT		DESCRIPTION		REMARKS
	R-5	-	2.6'		-	-	-		SHALE, black to dark gray, medium hard to soft, highly weathered, thin to laminated bedding, flat relative dip, closely spaced fractures, flat relative dip *(continued)*		Very broken 20.1' to 20.5'
21.5				30				21.5		1118.5	
									End of Boring at 21.5' upon rock core completion.		Boring converted to long term monitoring well

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. B-8
SHEET 1 OF 2
DATE: START 2/24/21
END 2/24/21
Approx.ELEV. 1169

PROJECT NAME ACAA RSA Improvements
PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA
LAT. 40.353713
LONG. -79.94274
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: TIME: DATE:
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21 DEPTH: TIME: DATE:
NOT ENCOUNTERED ☒

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 0.6	S-1	50 50/0.1	0.6'	-	-	-	Dry	0.3 Topsoil 1168.7 Highly weathered SANDSTONE cobbles and boulders, tan, dry, calcareous, very dense [Fill]	Difficult to start walking auger
3.0 3.8	S-2	30 50/0.3	0.8'	-	-	-	Dry		
6.0 7.5	S-3	7 9 6	1.0'	-	1.5	CL	Damp	6.0 1163.0 LEAN CLAY with Sand, brown to reddish brown, damp, calcareous in spots, stiff [Residual]	
									Slow advancement
9.0 10.5	S-4	15 28 24	1.5'	-	-	-	Dry	9.0 1160.0 Highly weathered LIMESTONE, gray and tan, dry, calcareous, very dense [Residual]	35.1 ppm on PID Environmental sample taken at S-3 and S-4
12.0 13.2	S-5	35 48 50/0.2	1.2'	-	-	-	Dry		
15.0 15.9	S-6	42 50/0.4	0.9'	-	-	-	Dry		
18.0 19.4	S-7	18 25 50/0.4	1.4'	-	-	-	Dry		Environmental sample taken at S-7 and S-8

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. **B-8**
SHEET **2** OF **2**
DATE: START **2/24/21**
END **2/24/21**
Approx.ELEV. **1169**

PROJECT NAME **ACAA RSA Improvements** PROJECT NUMBER **C191167.00**
LOCATION **West Mifflin, PA** LAT. **40.353713** LONG. **-79.94274**
INSPECTOR **T Dujmic**
DRILLERS COMPANY / NAME **GMI/Matt Hart**
EQUIPMENT USED **CME 55 Track Rig with Automatic Hammer**
DRILLING METHODS **3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing**
CASING: SIZE: ______ ; DEPTH: ______ ; WATER: DEPTH: ______ TIME: ______ DATE: ______
CHECKED BY: **Robert R. Joyner** ; DATE: **3/9/21** DEPTH: ______ TIME: ______ DATE: ______
NOT ENCOUNTERED ☒

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
21.0								Highly weathered LIMESTONE, gray and tan, dry, calcareous, very dense [Residual] *(continued)* 21.0 1148.0	
21.7	S-8	29 50/0.2	0.7'	-	-	-	Dry	Highly weathered CLAYSTONE, tan, dry, fissured, calcareous, very dense [Residual]	
24.0								24.0 1145.0	
25.1	S-9	15 27	1.1'	-	-	-	Dry	Highly weathered LIMESTONE, gray and tan, black on some fracture surfaces, dry, calcareous, very dense [Residual] 25.1 1143.9	
25.1	S-10	50/0.1 50/0.0		-		-	-	End of Boring at 25.1' upon spoon refusal. Backfilled with auger cuttings.	Temporary piezometer installed for 24-hr water level readings

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. B-9
SHEET 1 OF 2
DATE: START 3/1/21
END 3/1/21
Approx.ELEV. 1162

PROJECT NAME ACAA RSA Improvements
PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA
LAT. 40.353388
LONG. -79.942385
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing and NQ2 Wireline
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: Dry TIME: Pre-Core DATE: 3/1/21
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21 DEPTH: 28.4' TIME: 0-HR DATE: 3/1/21
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
0.0 1.5	S-1	1 5 3	1.0'	-		gc	Damp	0.4 Top soil 1161.6 LEAN CLAY with Sand and ROCK fragments, brown with gray, dry to damp, loose to medium dense [Fill]	
3.0									
4.5	S-2	6 9 9	1.5'	-		CL	Dry		Environmental sample taken at S-2
6.0									
7.5	S-3	12 12 14	0.4'	-		-	Dry	6.0 1156.0 Highly weathered LIMESTONE, grayish tan, dry, mediun dense to dense [Residual]	
9.0									
10.5	S-4	10 21 22	1.5'	-		-	Dry		
12.0									
12.9	S-5	31 50/0.4	0.9'	-		-	Dry	12.0 1150.0 Highly weathered SHALE, gray, dray, calcareous, very dense [Residual]	Environmental sample taken at S-5
15.0									
16.3	S-6	13 16 50/0.3	1.3'	-		-	Dry	15.0 1147.0 Highly weathered LIMESTONE, tan and gray, dry, very dense [Residual]	
17.0									
17.1	S-7	50/0.1	0.1'	-		-	Dry	17.1 1144.9 LIMESTONE, gray, hard, weathered, bedding not apparent, very steep fractures	Loud grind. Auger refusal at 17.0'
20.0	R-1	-	0.9'	31 / 0	-	-	-	17.5 1144.5 CLAYSTONE, brown, soft to very soft, highly weathered, bedding not apparent, close to medium spaced fractures, flat to shallow relative dip	Core barrell blocked by clay on R-1, low recovery

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

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FIELD BORING LOG

BORING NO. B-9
SHEET 2 OF 2
DATE: START 3/1/21
END 3/1/21
Approx.ELEV. 1162

PROJECT NAME ACAA RSA Improvements
PROJECT NUMBER C191167.00
LOCATION West Mifflin, PA LAT. 40.353388 LONG. -79.942385
INSPECTOR T Dujmic
DRILLERS COMPANY / NAME GMI/Matt Hart
EQUIPMENT USED CME 55 Track Rig with Automatic Hammer
DRILLING METHODS 3.25" Inside Diameter Hollow Stem Auger in Conjunction with Standard Penetration Testing and NQ2 Wireline
CASING: SIZE: ; DEPTH: ; WATER: DEPTH: Dry TIME: Pre-Core DATE: 3/1/21
CHECKED BY: Robert R. Joyner ; DATE: 3/9/21 DEPTH: 28.4' TIME: 0-HR DATE: 3/1/21
NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	POCKET PENT/ TORVANE (TSF)	USCS OR ROCK BROKENNESS	H_2O CONTENT	DESCRIPTION	REMARKS
21.5	R-2	-	1.5'	100 67	-	-	-	CLAYSTONE, brown, soft to very soft, highly weathered, bedding not apparent, close to medium spaced fractures, flat to shallow relative dip *(continued)*	
24.7	R-3	-	3.2'	100 13	-	-	-	23.5 1138.5 LIMESTONE, brown to gray, medium to hard, weathered to minor weathering, bedding not apparent, medium spaced thin clay seams, medium spaced fractures, flat to shallow relative dip	
26.5	R-4	-	1.7'	94 44	-	-	-		Very broken: 25.4' - 25.9' ~25.7': Water loss
29.5	R-5	-	2.7'	90 40	-	-	-	28.8 1133.2 SHALE, black, soft, highly weathered, laminated bedding, flat relative dip, very broken, closely spaced fractures, flat to very steep relative dip 29.5 1132.5 End of boring at 29.5' upon spoon refusal. Backfilled with auger cuttings.	

Note: Soil classification symbols above that are determined by visual observation are shown with lowercase letters (e.g. sm) while classification symbols determined by laboratory testing are shown in capital letters (e.g. SM).

APPENDIX B

Laboratory Test Data

geotechnics
geotechnical & geosynthetic testing

March 18, 2021

Project No. 221-145-001

Mr. Bruce Roth
GAI Consultants, Inc.
385 East Waterfront Drive
Homestead, PA 15120

Transmittal
Laboratory Test Results
ACAA RSA C191167.00

Please find attached the laboratory test results for the above referenced project. The tests were outlined on the Project Verification Form that was transmitted to your firm prior to the testing. The testing was performed in general accordance with the methods listed on the enclosed data sheets. The test results are believed to be representative of the samples that were submitted for testing and are indicative only of the specimens that were evaluated. We have no direct knowledge of the origin of the samples and imply no position with regard to the nature of the test results, i.e. pass/fail and no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization by our Client. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please contact our office.

Respectfully submitted,
Geotechnics, Inc.

Nathan Melaro
Director of Operations

We understand that you have a choice in your laboratory services and we thank you for choosing Geotechnics.

MOISTURE CONTENT

ASTM D 2216-19

Client:	GAI Consultants, Inc.
Client Reference:	ACAA RSA C191167.00
Project No.:	2021-145-001

Lab ID:	001	002	003	004	005
Boring No.:	B-1	B-2	B-4	B-5	B-7
Depth (ft):	6.0-7.5'	3.0-4.5'	3.0-4.5'	3.0-4.5'	3.0-4.5'
Sample No.:	S-3	S-2	S-2	S-2	S-2
Tare Number	17	35	49	2	31
Wt. of Tare & Wet Sample (g)	37.35	54.64	25.34	30.75	31.52
Wt. of Tare & Dry Sample (g)	32.00	47.25	23.57	24.16	27.66
Weight of Tare (g)	8.58	8.53	8.31	8.32	8.36
Weight of Water (g)	5.35	7.39	1.77	6.59	3.86
Weight of Dry Sample (g)	23.42	38.72	15.26	15.84	19.30
Water Content (%)	**22.8**	**19.1**	**11.6**	**41.6**	**20.0**

Lab ID	006	007	011	012	013
Boring No.	B-8	B-9	B-3	B-1	B-1
Depth (ft)	6.0-7.5'	3.0-4.5'	3.0-3.7'	3.0-4.5'	12.0-13.4'
Sample No.	S-3	S-2	S-2	S-2	S-5
Tare Number	40	16	29	38	13
Wt. of Tare & Wet Sample (g)	20.13	30.35	34.37	50.19	57.84
Wt. of Tare & Dry Sample (g)	17.97	27.29	30.33	40.68	50.64
Weight of Tare (g)	8.49	8.31	8.56	8.33	8.44
Weight of Water (g)	2.16	3.06	4.04	9.51	7.20
Weight of Dry Sample (g)	9.48	18.98	21.77	32.35	42.20
Water Content (%)	**22.8**	**16.1**	**18.6**	**29.4**	**17.1**

Notes :

Tested By *SG* *Date* *3/9/21* *Checked By* *JLK* *Date* *3/10/21*

MOISTURE CONTENT

ASTM D 2216-19

Client:	GAI Consultants, Inc.
Client Reference:	ACAA RSA C191167.00
Project No.:	2021-145-001

Lab ID:	014	015	016	017	018
Boring No.:	B-2	B-2	B-4	B-4	B-5
Depth (ft):	6.0-7.5'	12.0-13.5'	6.0-7.5'	9.0-10.5'	6.0-7.5'
Sample No.:	S-3	S-5	S-3	S-4	S-3
Tare Number	39	46	24	43	47
Wt. of Tare & Wet Sample (g)	71.77	85.27	66.23	68.13	43.77
Wt. of Tare & Dry Sample (g)	60.82	67.70	57.97	56.97	35.59
Weight of Tare (g)	8.53	8.53	8.45	5.58	8.72
Weight of Water (g)	10.95	17.57	8.26	11.16	8.18
Weight of Dry Sample (g)	52.29	59.17	49.52	51.39	26.87
Water Content (%)	**20.9**	**29.7**	**16.7**	**21.7**	**30.4**

Lab ID	019	020	021	022
Boring No.	B-6	B-7	B-8	B-9
Depth (ft)	3.0-4.5'	6.0-7.5'	9.0-10.5'	6.0-7.5'
Sample No.	S-2	S-3	S-4	S-3
Tare Number	50	4	34	19
Wt. of Tare & Wet Sample (g)	82.06	82.64	84.50	102.03
Wt. of Tare & Dry Sample (g)	75.73	72.15	74.80	90.68
Weight of Tare (g)	8.69	8.58	8.52	8.55
Weight of Water (g)	6.33	10.49	9.70	11.35
Weight of Dry Sample (g)	67.04	63.57	66.28	82.13
Water Content (%)	**9.4**	**16.5**	**14.6**	**13.8**

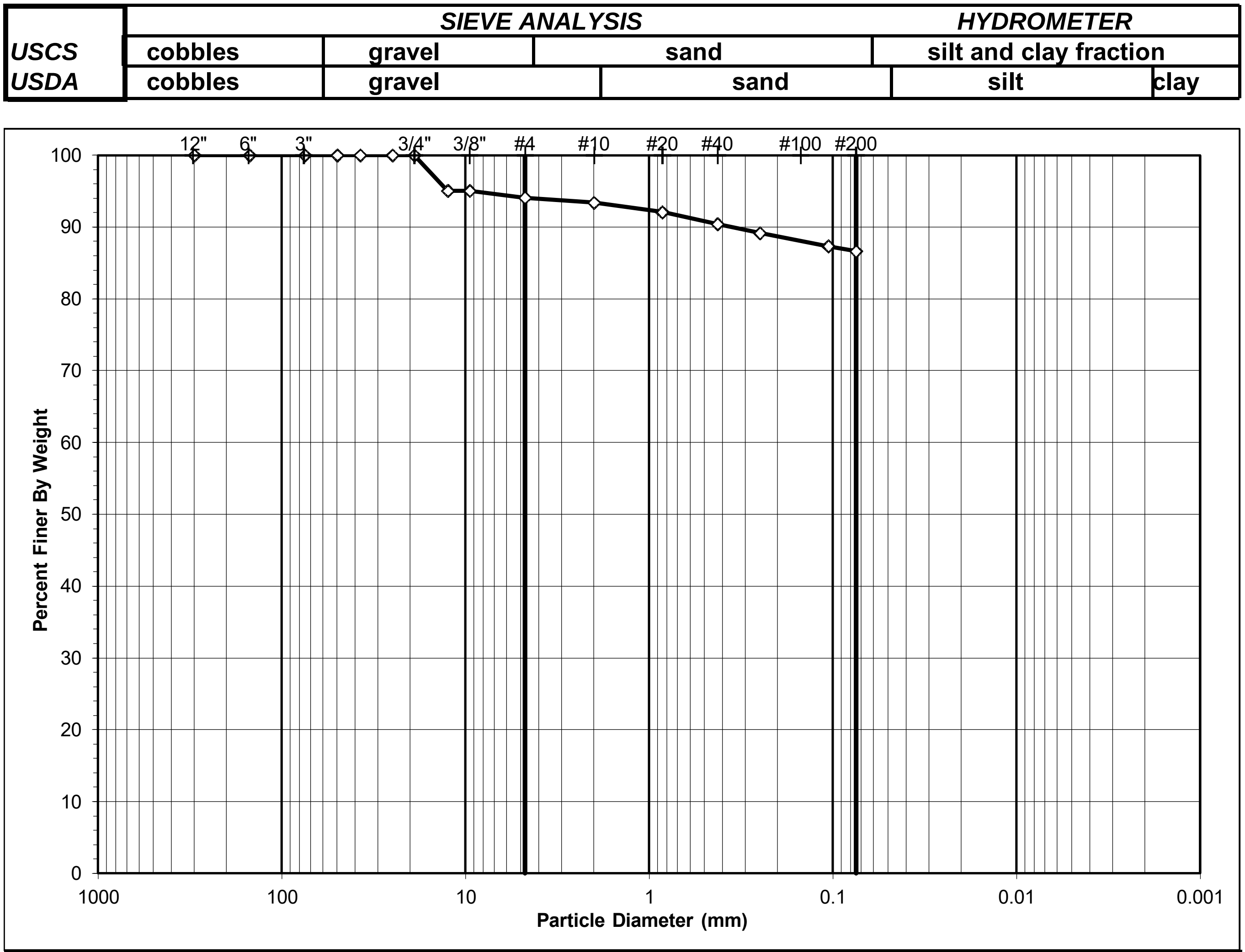
Notes :

Tested By *SG* *Date* *3/9/21* *Checked By* *JLK* *Date* *3/10/21*

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-1
Client Reference:	ACAA RSA C191167.00	Depth (ft):	6.0-7.5'
Project No.:	2021-145-001	Sample No.:	S-3
Lab ID:	2021-145-001-001	Soil Color:	Brown



USCS Summary

Sieve Size (mm)		Percentage (%)
Greater Than #4	*Gravel*	5.92
#4 to #200	*Sand*	7.45
Finer Than #200	*Silt & Clay*	86.63

USCS Symbol:
CL, TESTED

USCS Classification:
LEAN CLAY

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-1
Client Reference:	ACAA RSA C191167.00	Depth (ft):	6.0-7.5'
Project No.:	2021-145-001	Sample No.:	S-3
Lab ID:	2021-145-001-001	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1467	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	319.68	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	319.68	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	146.19	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	173.49	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	173.49
Dry Weight of - 3/4" Sample (g)	173.49	Weight of Minus #200 Material (g):	150.29
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	23.20
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	173.49		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	8.59		4.95	4.95	95.05	**95.05**
3/8"	9.50	0.00		0.00	4.95	95.05	**95.05**
#4	4.75	1.68		0.97	5.92	94.08	**94.08**
#10	2.00	1.18		0.68	6.60	93.40	**93.40**
#20	0.85	2.31	(**)	1.33	7.93	92.07	**92.07**
#40	0.425	2.88		1.66	9.59	90.41	**90.41**
#60	0.250	2.19		1.26	10.85	89.15	**89.15**
#140	0.106	3.14		1.81	12.66	87.34	**87.34**
#200	0.075	1.23		0.71	13.37	86.63	**86.63**
Pan	-	150.29		86.63	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/16/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-1
Client Reference:	ACAA RSA C191167.00	Depth (ft):	6.0-7.5'
Project No.:	2021-145-001	Sample No.:	S-3
Lab ID:	2021-145-001-001	Soil Description:	BROWN LEAN CLAY

(Minus #40 sieve material, Air dried)

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

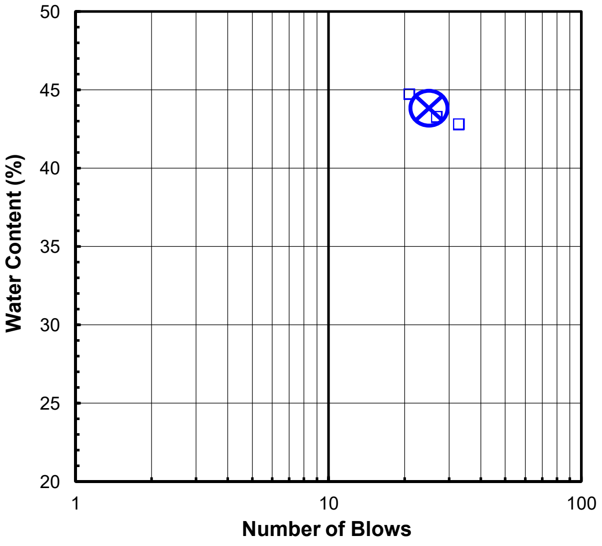
As Received Moisture Content		**Liquid Limit Test**			
ASTM D2216-19		**1**	**2**	**3**	**M**
Tare Number:	17	297	529	316	**U**
Wt. of Tare & Wet Sample (g):	37.35	43.67	40.73	40.64	**L**
Wt. of Tare & Dry Sample (g):	32.00	37.65	34.61	34.38	**T**
Weight of Tare (g):	8.58	23.57	20.45	20.37	**I**
Weight of Water (g):	5.4	6.0	6.1	6.3	**P**
Weight of Dry Sample (g):	23.4	14.1	14.2	14.0	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**22.8**	**42.8**	**43.2**	**44.7**	**N**
Number of Blows:		**33**	**27**	**21**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	147	143	
Wt. of Tare & Wet Sample (g):	26.84	26.75	
Wt. of Tare & Dry Sample (g):	25.62	25.48	
Weight of Tare (g):	20.43	19.97	
Weight of Water (g):	1.2	1.3	
Weight of Dry Sample (g):	5.2	5.5	
Moisture Content (%):	**23.5**	**23.0**	**0.5**

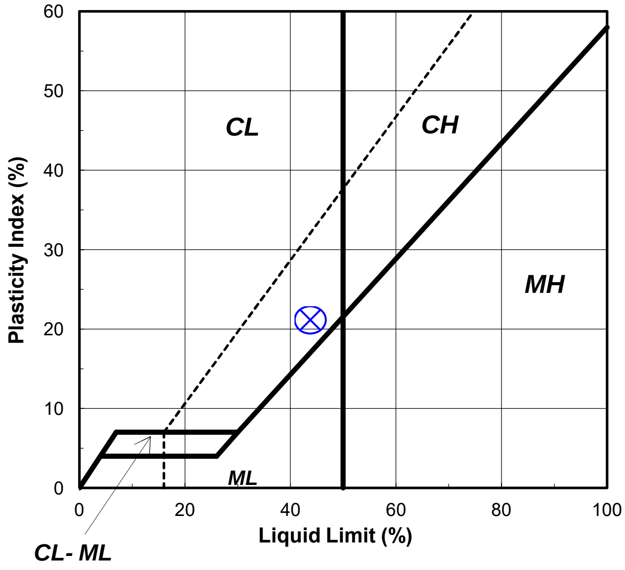
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**44**
Plastic Limit (%):	**23**
Plasticity Index (%):	**21**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



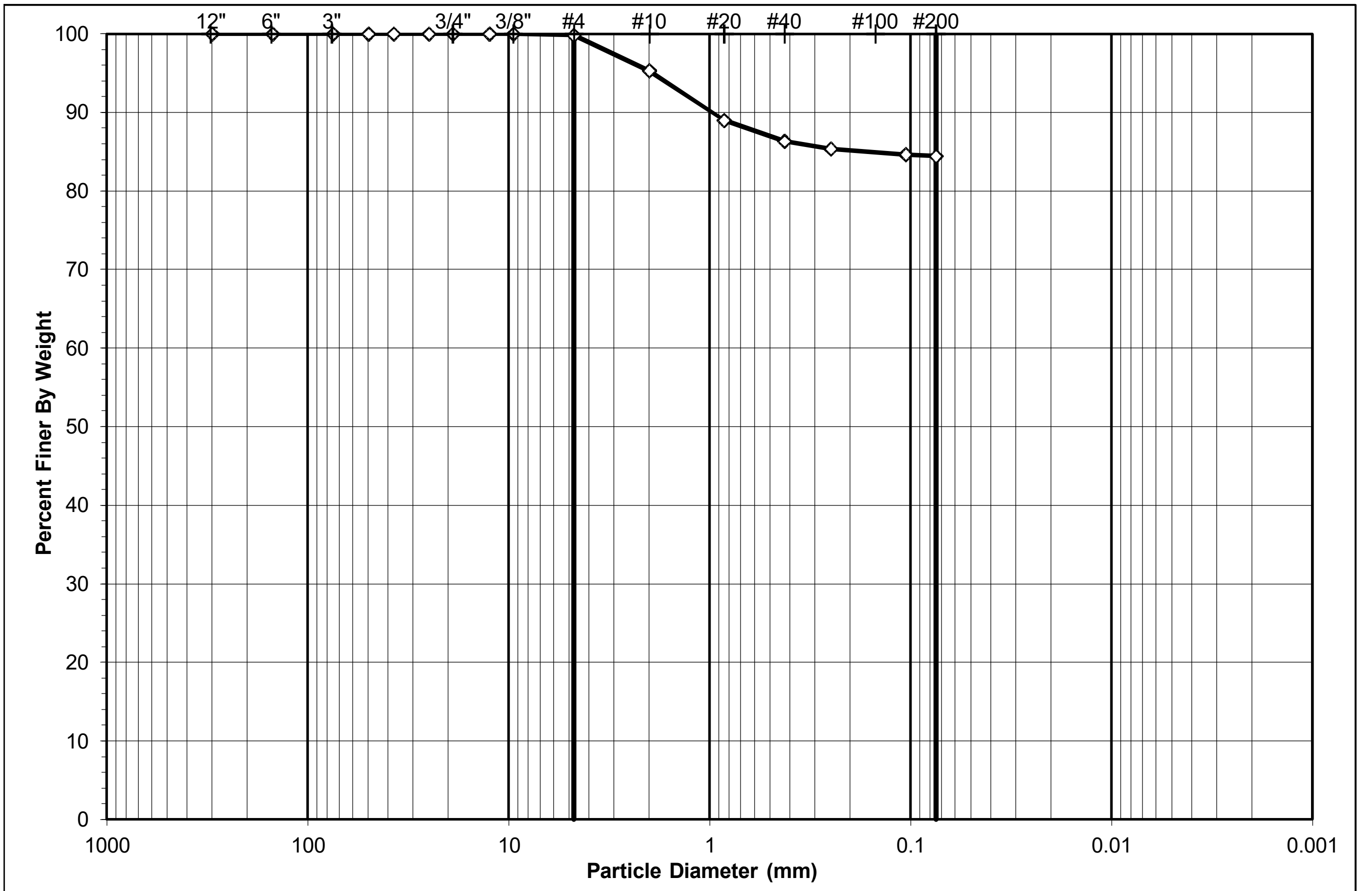
Tested By	*FS*	*Date*	*3/13/21*	*Checked By*	*JLK*	*Date*	3/16/21

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-2
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-002	Soil Color:	Brown

	SIEVE ANALYSIS			HYDROMETER	
USCS	**cobbles**	**gravel**	**sand**	**silt and clay fraction**	
USDA	**cobbles**	**gravel**	**sand**	**silt**	**clay**



USCS Summary

Sieve Size (mm)		**Percentage (%)**
Greater Than #4	*Gravel*	0.18
#4 to #200	*Sand*	15.40
Finer Than #200	*Silt & Clay*	84.42

USCS Symbol:
CL, TESTED

USCS Classification:
LEAN CLAY WITH SAND

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-2
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-002	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1415	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	341.75	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	341.75	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.08	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	196.67	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	196.67
Dry Weight of - 3/4" Sample (g)	196.67	Weight of Minus #200 Material (g):	166.02
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	30.65
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	196.67		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00		0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00		0.00	0.00	100.00	**100.00**
#4	4.75	0.36		0.18	0.18	99.82	**99.82**
#10	2.00	8.84		4.49	4.68	95.32	**95.32**
#20	0.85	12.45	(**)	6.33	11.01	88.99	**88.99**
#40	0.425	5.23		2.66	13.67	86.33	**86.33**
#60	0.250	1.89		0.96	14.63	85.37	**85.37**
#140	0.106	1.42		0.72	15.35	84.65	**84.65**
#200	0.075	0.46		0.23	15.58	84.42	**84.42**
Pan	-	166.02		84.42	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/16/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-2
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-002	Soil Description:	BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description .

(Minus #40 sieve material, Air dried)

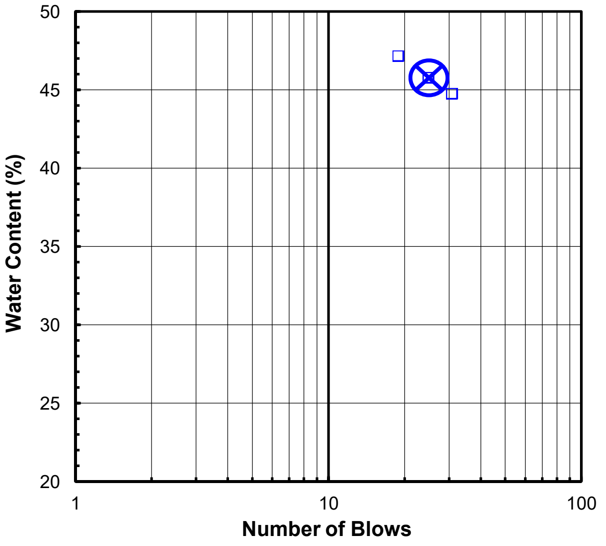
	As Received Moisture Content	**Liquid Limit Test**			
	ASTM D2216-19	**1**	**2**	**3**	**M**
Tare Number:	35	525	387	225	**U**
Wt. of Tare & Wet Sample (g):	54.64	40.58	39.08	38.57	**L**
Wt. of Tare & Dry Sample (g):	47.25	34.33	32.77	32.14	**T**
Weight of Tare (g):	8.53	20.35	18.97	18.49	**I**
Weight of Water (g):	7.4	6.3	6.3	6.4	**P**
Weight of Dry Sample (g):	38.7	14.0	13.8	13.7	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**19.1**	**44.7**	**45.7**	**47.1**	**N**
Number of Blows:		**31**	**25**	**19**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	600	625	
Wt. of Tare & Wet Sample (g):	25.10	24.95	
Wt. of Tare & Dry Sample (g):	23.76	23.60	
Weight of Tare (g):	18.87	18.51	
Weight of Water (g):	1.3	1.4	
Weight of Dry Sample (g):	4.9	5.1	
Moisture Content (%):	**27.4**	**26.5**	**0.9**

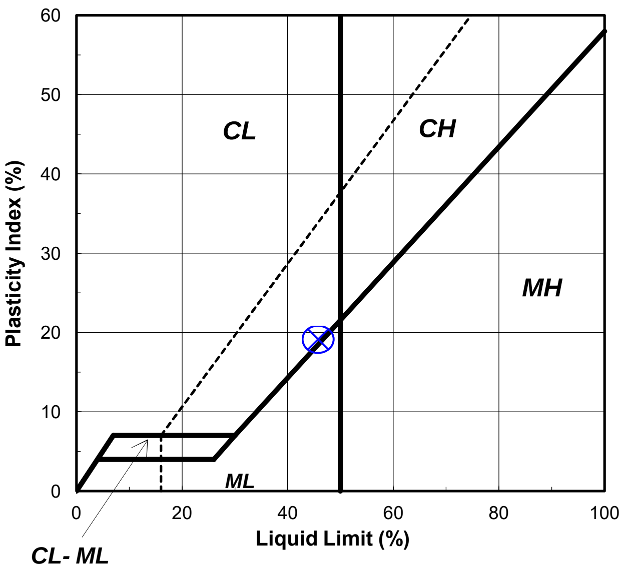
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**46**
Plastic Limit (%):	**27**
Plasticity Index (%):	**19**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By *FS* *Date* *3/13/21* *Checked By* *JLK* *Date* 3/16/21

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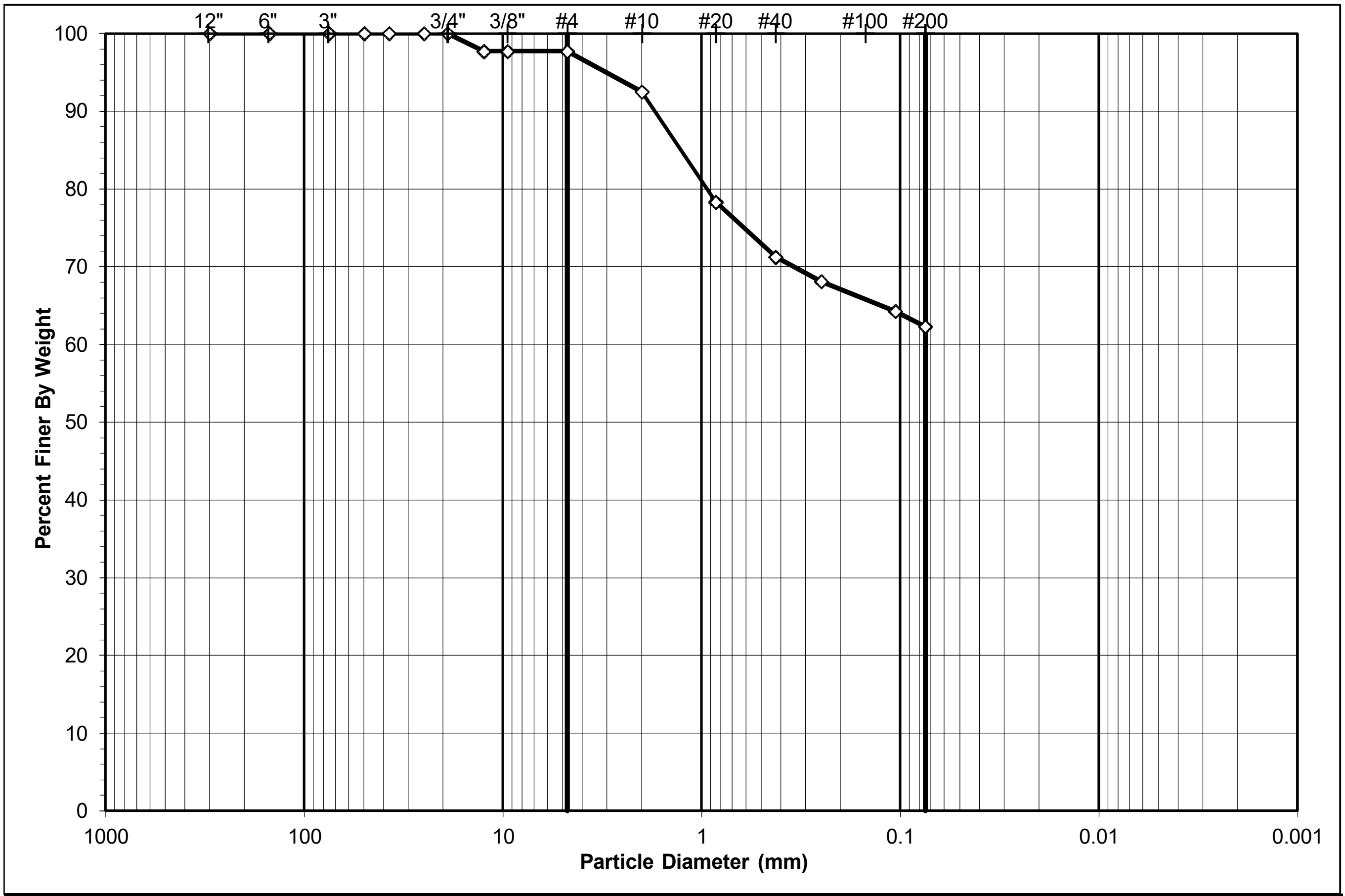
SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-4
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-003	Soil Color:	Brown

	SIEVE ANALYSIS			*HYDROMETER*	
USCS	**cobbles**	**gravel**	**sand**	**silt and clay fraction**	
USDA	**cobbles**	**gravel**	**sand**	**silt**	**clay**



USCS Summary

Sieve Size (mm)		Percentage (%)
Greater Than #4	*Gravel*	2.31
#4 to #200	*Sand*	35.41
Finer Than #200	*Silt & Clay*	62.29

USCS Symbol:
CL, TESTED

USCS Classification:
SANDY LEAN CLAY

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-4
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-003	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1542	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	299.41	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	299.41	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	143.90	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	155.51	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	155.51
Dry Weight of - 3/4" Sample (g)	155.51	Weight of Minus #200 Material (g):	96.86
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	58.65
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	155.51		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	3.59		2.31	2.31	97.69	**97.69**
3/8"	9.50	0.00		0.00	2.31	97.69	**97.69**
#4	4.75	0.00		0.00	2.31	97.69	**97.69**
#10	2.00	8.09		5.20	7.51	92.49	**92.49**
#20	0.85	22.06	(**)	14.19	21.70	78.30	**78.30**
#40	0.425	11.00		7.07	28.77	71.23	**71.23**
#60	0.250	4.86		3.13	31.90	68.10	**68.10**
#140	0.106	5.98		3.85	35.74	64.26	**64.26**
#200	0.075	3.07		1.97	37.71	62.29	**62.29**
Pan	-	96.86		62.29	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/17/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-4
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-003	Soil Description:	BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description *.*

(Minus #40 sieve material, Air dried)

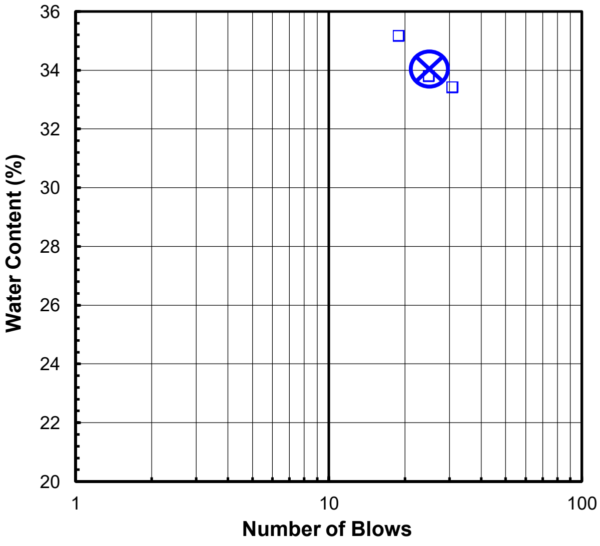
As Received Moisture Content ASTM D2216-19		**Liquid Limit Test** **1**	**2**	**3**	**M**
Tare Number:	49	525	387	229	**U**
Wt. of Tare & Wet Sample (g):	25.34	40.44	39.22	38.57	**L**
Wt. of Tare & Dry Sample (g):	23.57	35.41	34.11	33.27	**T**
Weight of Tare (g):	8.31	20.35	18.98	18.19	**I**
Weight of Water (g):	1.8	5.0	5.1	5.3	**P**
Weight of Dry Sample (g):	15.3	15.1	15.1	15.1	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**11.6**	**33.4**	**33.8**	**35.1**	**N**
Number of Blows:		**31**	**25**	**19**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	147	610	
Wt. of Tare & Wet Sample (g):	26.72	24.81	
Wt. of Tare & Dry Sample (g):	25.76	23.88	
Weight of Tare (g):	20.42	18.60	
Weight of Water (g):	1.0	0.9	
Weight of Dry Sample (g):	5.3	5.3	
Moisture Content (%):	**18.0**	**17.6**	**0.4**

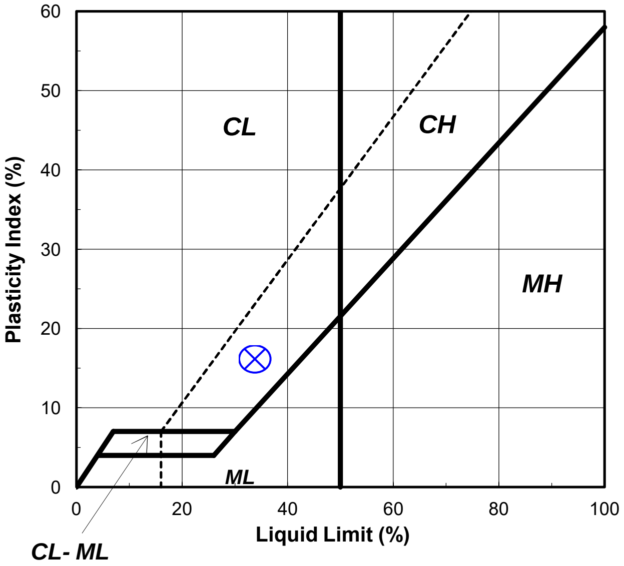
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**34**
Plastic Limit (%):	**18**
Plasticity Index (%):	**16**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



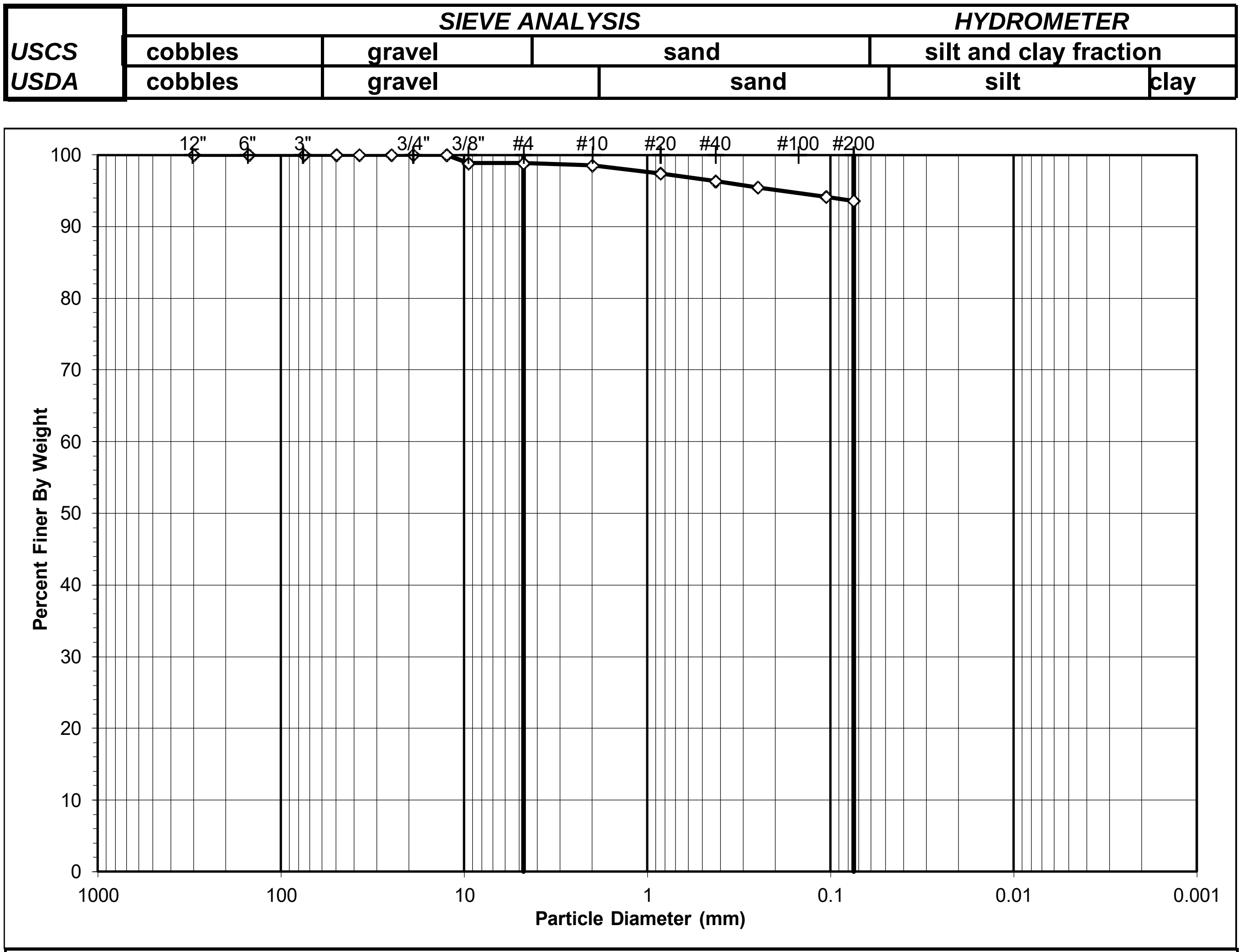
Tested By *FS* *Date* *3/15/21* *Checked By* *JLK* *Date* 3/16/21

page 1 of 1 DCN: CTS4B, DATE: 5/22/18 REVISION: 8

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-5
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-004	Soil Color:	Brown



USCS Summary

Sieve Size (mm)		Percentage (%)
Greater Than #4	*Gravel*	1.17
#4 to #200	*Sand*	5.23
Finer Than #200	*Silt & Clay*	93.59

USCS Symbol:

CH, TESTED

USCS Classification:

FAT CLAY

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-5
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-004	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1435	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	279.10	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	279.10	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.32	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	133.78	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	133.78
Dry Weight of - 3/4" Sample (g)	133.78	Weight of Minus #200 Material (g):	125.21
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	8.57
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	133.78		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00		0.00	0.00	100.00	**100.00**
3/8"	9.50	1.57		1.17	1.17	98.83	**98.83**
#4	4.75	0.00		0.00	1.17	98.83	**98.83**
#10	2.00	0.40		0.30	1.47	98.53	**98.53**
#20	0.85	1.50	(**)	1.12	2.59	97.41	**97.41**
#40	0.425	1.44		1.08	3.67	96.33	**96.33**
#60	0.250	1.15		0.86	4.53	95.47	**95.47**
#140	0.106	1.76		1.32	5.85	94.15	**94.15**
#200	0.075	0.75		0.56	6.41	93.59	**93.59**
Pan	-	125.21		93.59	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/17/21 Checked By JLK Date 3/18/21

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ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-5
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-004	Soil Description:	BROWN FAT CLAY

***Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description*.** (Minus #40 sieve material, Air dried)

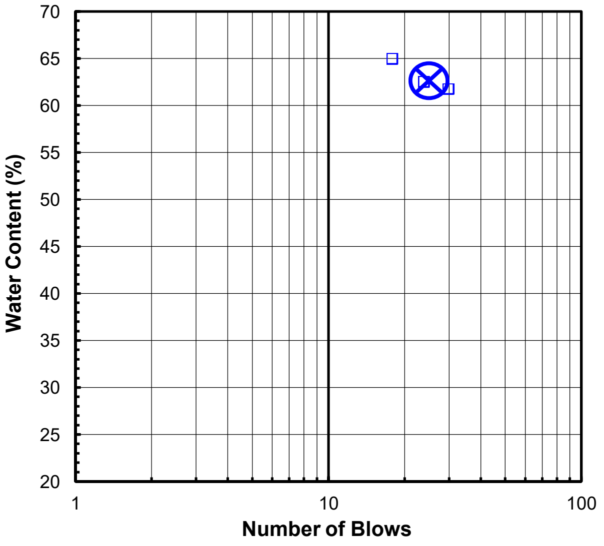
As Received Moisture Content ASTM D2216-19		**Liquid Limit Test** **1**	**2**	**3**	**M**
Tare Number:	2	297	539	544	**U**
Wt. of Tare & Wet Sample (g):	30.75	43.82	40.61	40.56	**L**
Wt. of Tare & Dry Sample (g):	24.16	36.09	32.86	32.59	**T**
Weight of Tare (g):	8.32	23.56	20.45	20.31	**I**
Weight of Water (g):	6.6	7.7	7.8	8.0	**P**
Weight of Dry Sample (g):	15.8	12.5	12.4	12.3	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**41.6**	**61.7**	**62.4**	**64.9**	**N**
Number of Blows:		**30**	**24**	**18**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	143	150	
Wt. of Tare & Wet Sample (g):	26.24	25.79	
Wt. of Tare & Dry Sample (g):	25.06	24.63	
Weight of Tare (g):	19.96	19.76	
Weight of Water (g):	1.2	1.2	
Weight of Dry Sample (g):	5.1	4.9	
Moisture Content (%):	**23.1**	**23.8**	**-0.7**

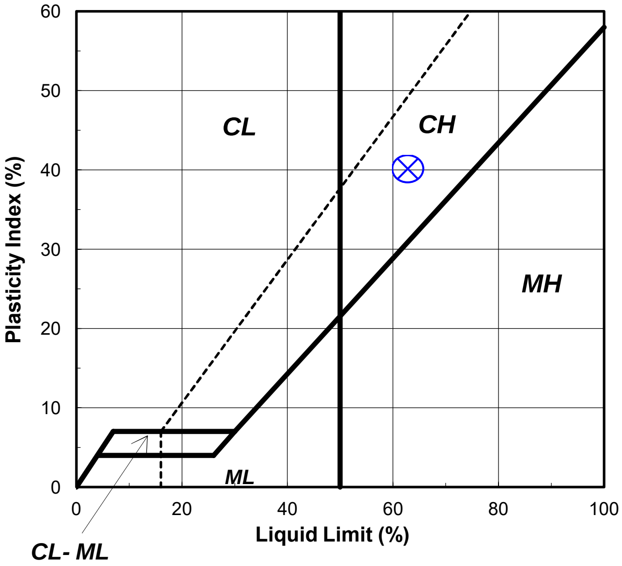
Note: The acceptable range of the two Moisture Contents is ± 1.4

Test Results	
Liquid Limit (%):	**63**
Plastic Limit (%):	**23**
Plasticity Index (%):	**40**
USCS Symbol:	**CH**

Flow Curve



Plasticity Chart



Tested By	*FS*	*Date*	*3/15/21*	*Checked By*	*JLK*	*Date*	3/16/21

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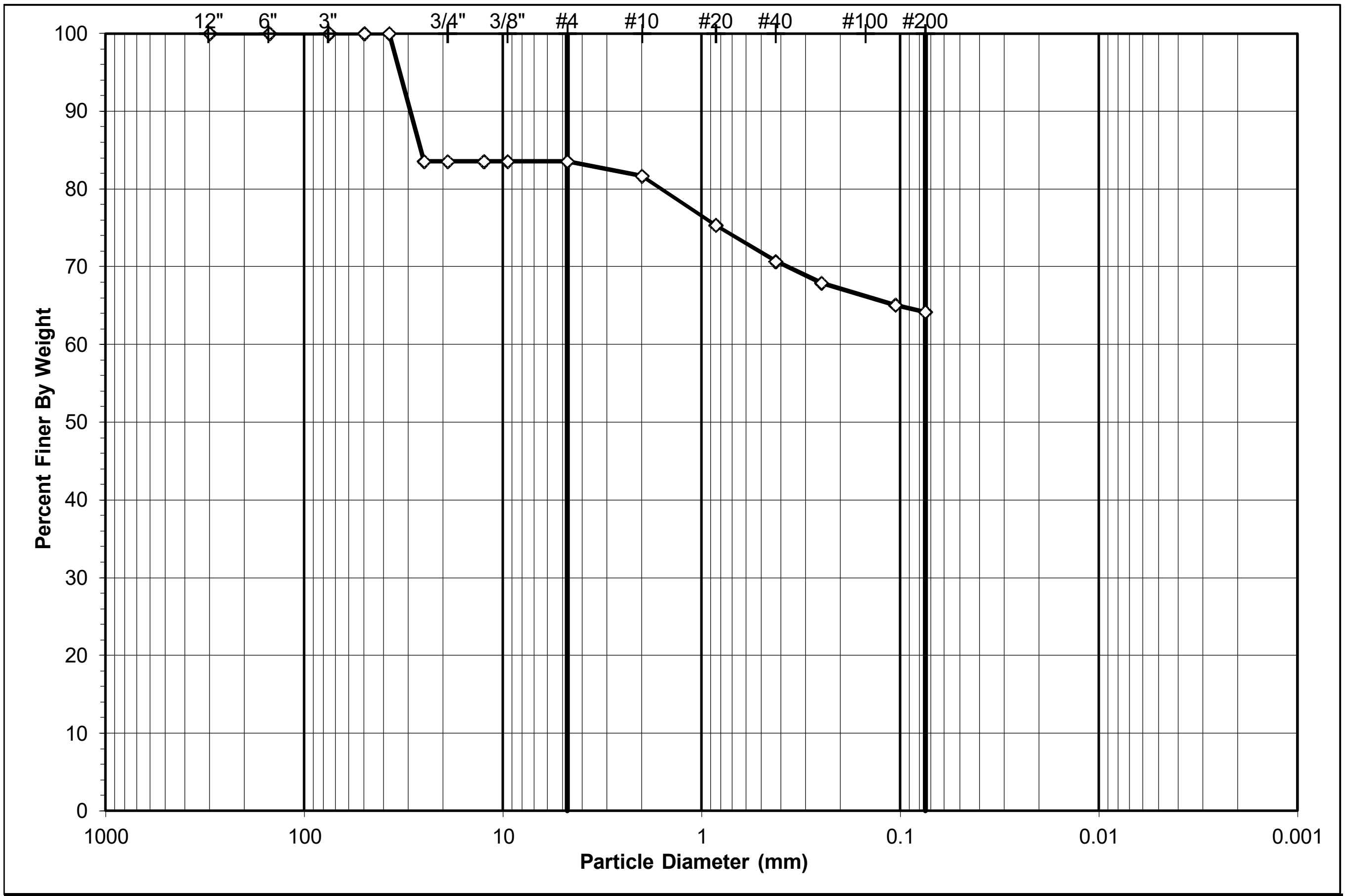
SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-7
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-005	Soil Color:	Brown

	SIEVE ANALYSIS			*HYDROMETER*	
USCS	**cobbles**	**gravel**	**sand**	**silt and clay fraction**	
USDA	**cobbles**	**gravel**	**sand**	**silt**	**clay**



USCS Summary

Sieve Size (mm)		**Percentage (%)**
Greater Than #4	*Gravel*	16.46
#4 to #200	*Sand*	19.34
Finer Than #200	*Silt & Clay*	64.19

USCS Symbol:

CL, TESTED

USCS Classification:

SANDY LEAN CLAY WITH GRAVEL

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client: GAI Consultants, Inc.
Client Reference: ACAA RSA C191167.00
Project No.: 2021-145-001
Lab ID: 2021-145-001-005

Boring No.: B-7
Depth (ft): 3.0-4.5'
Sample No.: S-2
Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1426	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	303.96	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	303.96	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	144.21	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	159.75	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	159.75
Dry Weight of - 3/4" Sample (g)	133.45	Weight of Minus #200 Material (g):	102.55
Wet Weight of +3/4" Sample (g)	26.30	Weight of Plus #200 Material (g):	57.20
Dry Weight of + 3/4" Sample (g)	26.30		
Total Dry Weight of Sample (g):	159.75		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	26.30		16.46	16.46	83.54	**83.54**
3/4"	19.0	0.00		0.00	16.46	83.54	**83.54**
1/2"	12.5	0.00		0.00	16.46	83.54	**83.54**
3/8"	9.50	0.00		0.00	16.46	83.54	**83.54**
#4	4.75	0.00		0.00	16.46	83.54	**83.54**
#10	2.00	2.98		1.87	18.33	81.67	**81.67**
#20	0.85	10.10	(**)	6.32	24.65	75.35	**75.35**
#40	0.425	7.47		4.68	29.33	70.67	**70.67**
#60	0.250	4.43		2.77	32.10	67.90	**67.90**
#140	0.106	4.53		2.84	34.94	65.06	**65.06**
#200	0.075	1.39		0.87	35.81	64.19	**64.19**
Pan	-	102.55		64.19	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/17/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-7
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-005	Soil Description:	BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

(Minus #40 sieve material, Air dried)

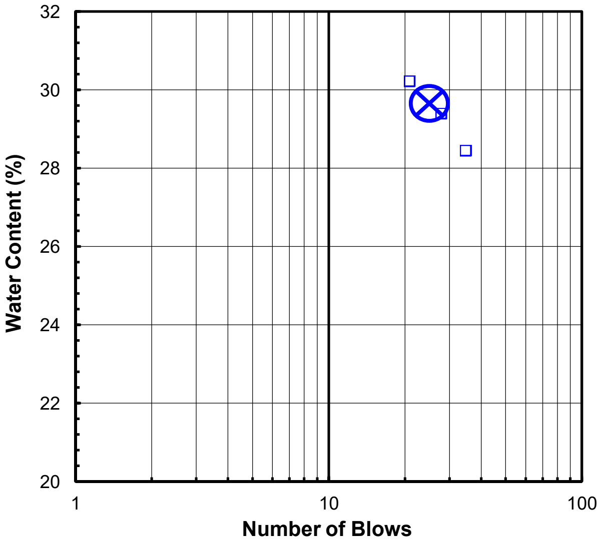
As Received Moisture Content		**Liquid Limit Test**			
ASTM D2216-19		**1**	**2**	**3**	**M**
Tare Number:	31	545	577	2224	**U**
Wt. of Tare & Wet Sample (g):	31.52	40.71	40.42	39.57	**L**
Wt. of Tare & Dry Sample (g):	27.66	36.25	35.87	34.91	**T**
Weight of Tare (g):	8.36	20.56	20.38	19.48	**I**
Weight of Water (g):	3.9	4.5	4.6	4.7	**P**
Weight of Dry Sample (g):	19.3	15.7	15.5	15.4	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**20.0**	**28.4**	**29.4**	**30.2**	**N**
Number of Blows:		**35**	**28**	**21**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	516	624	
Wt. of Tare & Wet Sample (g):	25.42	24.44	
Wt. of Tare & Dry Sample (g):	24.48	23.46	
Weight of Tare (g):	19.32	18.38	
Weight of Water (g):	0.9	1.0	
Weight of Dry Sample (g):	5.2	5.1	
Moisture Content (%):	**18.2**	**19.3**	**-1.1**

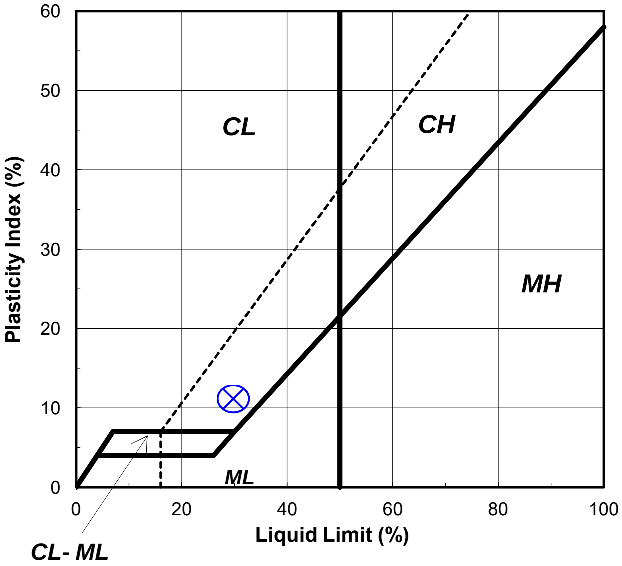
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**30**
Plastic Limit (%):	**19**
Plasticity Index (%):	**11**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



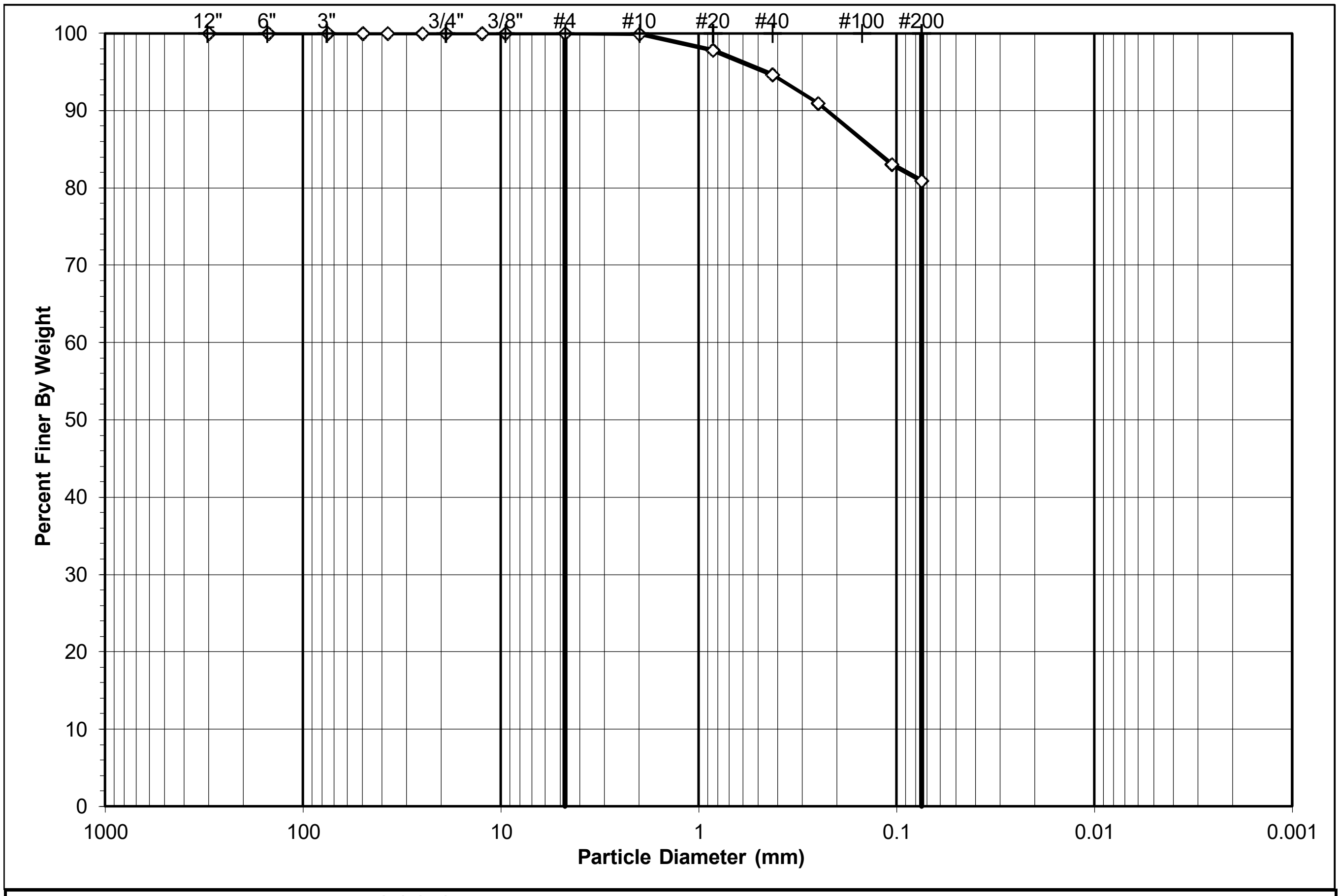
Tested By *FS* *Date* *3/15/21* *Checked By* *JLK* *Date* 3/16/21

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-8
Client Reference:	ACAA RSA C191167.00	Depth (ft):	6.0-7.5'
Project No.:	2021-145-001	Sample No.:	S-3
Lab ID:	2021-145-001-006	Soil Color:	Brown

	SIEVE ANALYSIS			*HYDROMETER*	
USCS	cobbles	gravel	sand	silt and clay fraction	
USDA	cobbles	gravel	sand	silt	clay



USCS Summary

Sieve Size (mm)		Percentage (%)
Greater Than #4	*Gravel*	0.00
#4 to #200	*Sand*	19.09
Finer Than #200	*Silt & Clay*	80.91

USCS Symbol:

CL, TESTED

USCS Classification:

LEAN CLAY WITH SAND

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client: GAI Consultants, Inc.
Client Reference: ACAA RSA C191167.00
Project No.: 2021-145-001
Lab ID: 2021-145-001-006

Boring No.: B-8
Depth (ft): 6.0-7.5'
Sample No.: S-3
Soil Color: Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1427	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	230.53	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	230.53	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	145.49	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	85.04	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	85.04
Dry Weight of - 3/4" Sample (g)	85.04	Weight of Minus #200 Material (g):	68.81
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	16.23
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	85.04		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	0.00		0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00		0.00	0.00	100.00	**100.00**
#4	4.75	0.00		0.00	0.00	100.00	**100.00**
#10	2.00	0.08		0.09	0.09	99.91	**99.91**
#20	0.85	1.78	(**)	2.09	2.19	97.81	**97.81**
#40	0.425	2.69		3.16	5.35	94.65	**94.65**
#60	0.250	3.14		3.69	9.04	90.96	**90.96**
#140	0.106	6.72		7.90	16.94	83.06	**83.06**
#200	0.075	1.82		2.14	19.09	80.91	**80.91**
Pan	-	68.81		80.91	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/17/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-8
Client Reference:	ACAA RSA C191167.00	Depth (ft):	6.0-7.5'
Project No.:	2021-145-001	Sample No.:	S-3
Lab ID:	2021-145-001-006	Soil Description:	BROWN LEAN CLAY

***Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description*.** (Minus #40 sieve material, Air dried)

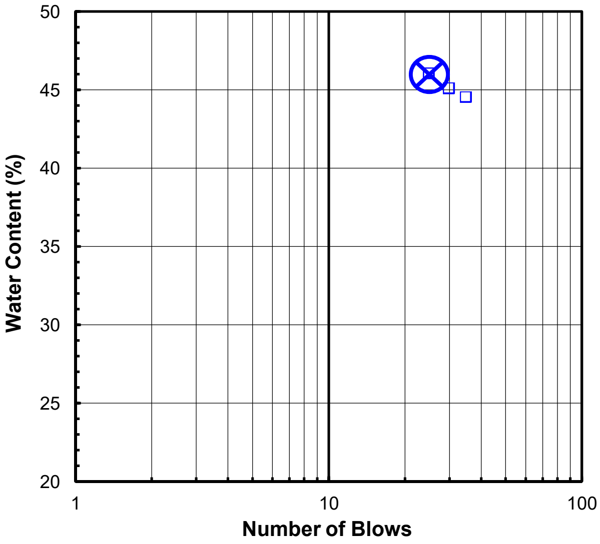
As Received Moisture Content		**Liquid Limit Test**			
ASTM D2216-19		**1**	**2**	**3**	**M**
Tare Number:	40	316	3395	225	**U**
Wt. of Tare & Wet Sample (g):	20.13	40.59	39.88	38.60	**L**
Wt. of Tare & Dry Sample (g):	17.97	34.36	33.59	32.26	**T**
Weight of Tare (g):	8.49	20.36	19.63	18.48	**I**
Weight of Water (g):	2.2	6.2	6.3	6.3	**P**
Weight of Dry Sample (g):	9.5	14.0	14.0	13.8	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**22.8**	**44.5**	**45.1**	**46.0**	**N**
Number of Blows:		**35**	**30**	**25**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	600	301	
Wt. of Tare & Wet Sample (g):	24.98	24.74	
Wt. of Tare & Dry Sample (g):	24.02	23.76	
Weight of Tare (g):	18.86	18.70	
Weight of Water (g):	1.0	1.0	
Weight of Dry Sample (g):	5.2	5.1	
Moisture Content (%):	**18.6**	**19.4**	**-0.8**

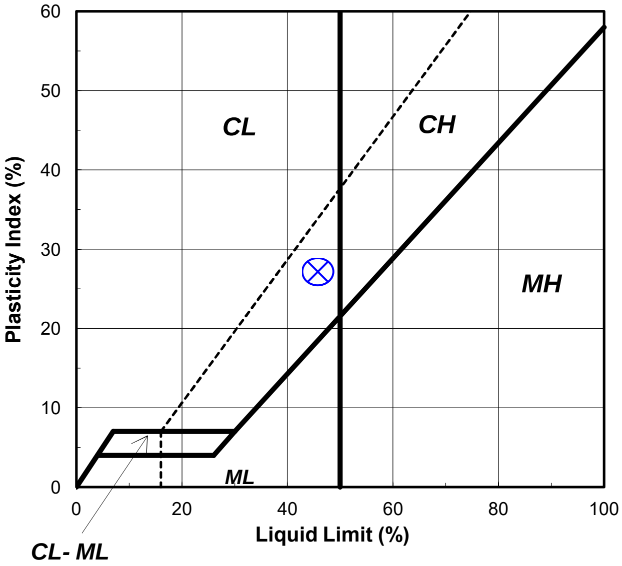
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**46**
Plastic Limit (%):	**19**
Plasticity Index (%):	**27**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



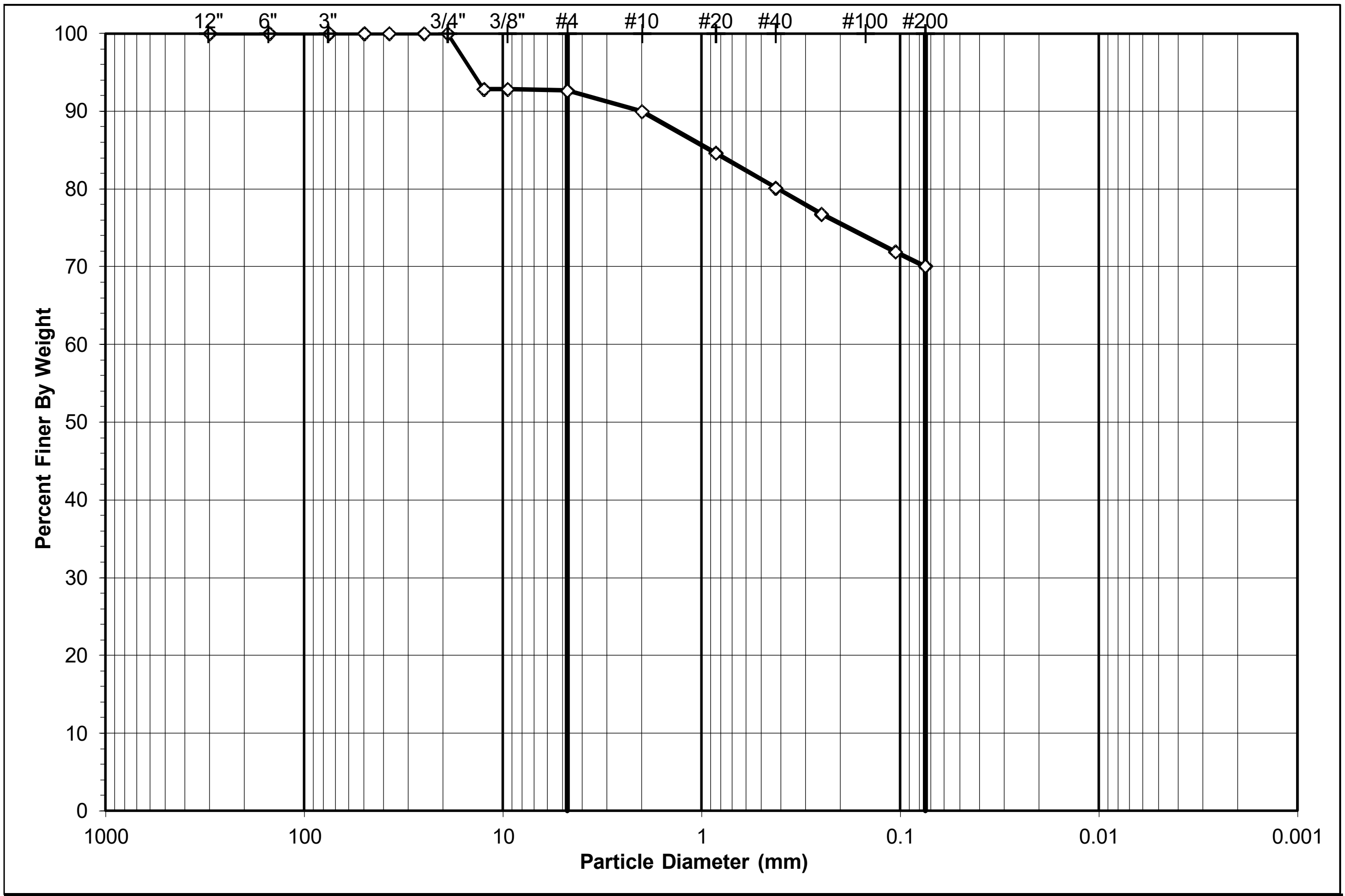
Tested By FS *Date* 3/15/21 *Checked By* JLK *Date* 3/16/21

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-9
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-007	Soil Color:	Brown

	SIEVE ANALYSIS			*HYDROMETER*	
USCS	**cobbles**	**gravel**	**sand**	**silt and clay fraction**	
USDA	**cobbles**	**gravel**	**sand**	**silt**	**clay**



USCS Summary

Sieve Size (mm)		**Percentage (%)**
Greater Than #4	*Gravel*	7.36
#4 to #200	*Sand*	22.57
Finer Than #200	*Silt & Clay*	70.07

USCS Symbol:
CL, TESTED

USCS Classification:
LEAN CLAY WITH SAND

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-9
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-4.5'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-007	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1518	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	257.68	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	257.68	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	147.50	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	110.18	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	110.18
Dry Weight of - 3/4" Sample (g)	110.18	Weight of Minus #200 Material (g):	77.20
Wet Weight of +3/4" Sample (g)	0.00	Weight of Plus #200 Material (g):	32.98
Dry Weight of + 3/4" Sample (g)	0.00		
Total Dry Weight of Sample (g):	110.18		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00		0.00	0.00	100.00	**100.00**
1/2"	12.5	7.90		7.17	7.17	92.83	**92.83**
3/8"	9.50	0.00		0.00	7.17	92.83	**92.83**
#4	4.75	0.21		0.19	7.36	92.64	**92.64**
#10	2.00	2.95		2.68	10.04	89.96	**89.96**
#20	0.85	5.88	(**)	5.34	15.37	84.63	**84.63**
#40	0.425	4.96		4.50	19.88	80.12	**80.12**
#60	0.250	3.71		3.37	23.24	76.76	**76.76**
#140	0.106	5.34		4.85	28.09	71.91	**71.91**
#200	0.075	2.03		1.84	29.93	70.07	**70.07**
Pan	-	77.20		70.07	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*

*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/17/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client: GAI Consultants, Inc.
Client Reference: ACAA RSA C191167.00
Project No.: 2021-145-001
Lab ID: 2021-145-001-007
Boring No.: B-9
Depth (ft): 3.0-4.5'
Sample No.: S-2
Soil Description: BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus #40 sieve material, Air dried)

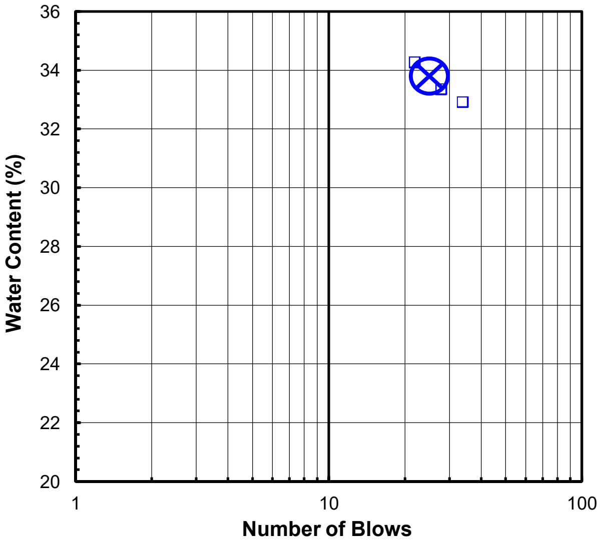
As Received Moisture Content		**Liquid Limit Test**			
ASTM D2216-19		**1**	**2**	**3**	**M**
Tare Number:	16	291	449	175	**U**
Wt. of Tare & Wet Sample (g):	30.35	46.34	43.37	39.78	**L**
Wt. of Tare & Dry Sample (g):	27.29	41.37	38.35	34.65	**T**
Weight of Tare (g):	8.31	26.26	23.29	19.67	**I**
Weight of Water (g):	3.1	5.0	5.0	5.1	**P**
Weight of Dry Sample (g):	19.0	15.1	15.1	15.0	**O**
Was As Received MC Preserved:	**Yes**				**I**
Moisture Content (%):	**16.1**	**32.9**	**33.3**	**34.2**	**N**
Number of Blows:		**34**	**28**	**22**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number:	303	310	
Wt. of Tare & Wet Sample (g):	25.64	24.77	
Wt. of Tare & Dry Sample (g):	24.80	23.93	
Weight of Tare (g):	19.61	18.74	
Weight of Water (g):	0.8	0.8	
Weight of Dry Sample (g):	5.2	5.2	
Moisture Content (%):	**16.2**	**16.2**	**0.0**

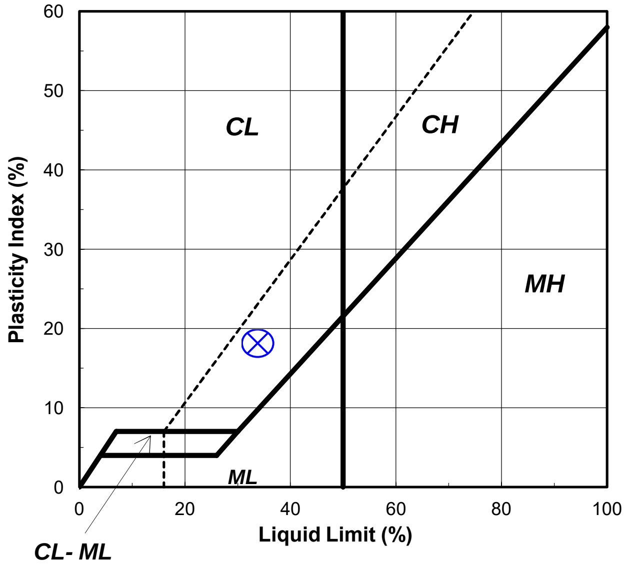
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**34**
Plastic Limit (%):	**16**
Plasticity Index (%):	**18**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By *FS* *Date* *3/15/21* *Checked By* *JLK* *Date* 3/16/21

UNCONFINED COMPRESSION STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C
This method does not report strain rate or deformation.
Sample Prep and Conformance Verification: ASTM D 4543-08

Client:	GAI Consultants, Inc.	Boring No.:	B-7
Client Project:	ACAA RSA C191167.00	Depth (ft):	9.1-10.0
Project No.:	2021-145-001	Sample ID:	R-1
Lab ID No.:	2021-145-001-008	Moisture Condition:	As Received-Unpreserved

Specimen Weight (g): **524.30**

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):	
Reading 1:	3.98	Reading 1:	1.99
Reading 2:	3.98	Reading 2:	1.99
Reading 3:	3.98	Average:	**1.99**
Average:	**3.98**	Area (in^2):	3.11
		L/D:	2.00

MOISTURE CONTENT			
Tare Number:	3123	Total Load (lb):	50,360
Wt. of Tare & Wet Sample (g):	456.10	**Uniaxial Compressive Strength (psi):**	**16,180**
Wt. of Tare & Dry Sample (g):	445.13		
Weight of Tare (g):	8.13	Fracture Type:	**Cone & Split**
Weight of Wet Sample (g):	447.97		
Sample Volume (cm^3):	203.16	Rate of Loading (lb/sec):	199
Moisture Content (%):	2.51	Time to Break (min:sec):	4:12.86
Unit Wet Weight (g/cm^3):	2.581	Deviation From Straightness[3]:	
Unit Wet Weight (pcf):	161.0		
Unit Dry Weight (g/cm^3):	2.518	AXIAL: *Pass* TOP: *Pass*	BOTTOM: *Pass*
Unit Dry Weight (pcf):	157.1		

Physical Description: Rock Core

Notes:
1) Moisture conditions at time of the test are: As Received-Unpreserved
2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
3) Deviation from straightness, Procedure A of ASTM D 4543-08
   Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
4) Temperature is laboratory room temperature.
5) D4543 Prep and D7012 Testing Equipment Used:
6) Tool / Machine List:
   G788 Compression Machine
   G1661 Digital Calipers, G1380 Dial Gauge
   G1616 Straight Edge, G1571 Feeler Gauge
   G1633 V-Block, G1634 Rock Saw, G1635 Grinder

Tested By: JAC Date: 3/9/21 *Checked By:* NJM *Date:* 3/11/21

UNCONFINED COMPRESSION STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C
This method does not report strain rate or deformation.
Sample Prep and Conformance Verification: ASTM D 4543-08

Client:	GAI Consultants, Inc.	Boring No.:	B-7
Client Project:	ACAA RSA C191167.00	Depth (ft):	15.6-17.4
Project No.:	2021-145-001	Sample ID:	R-4
Lab ID No.:	2021-145-001-009	Moisture Condition:	As Received-Unpreserved

Specimen Weight (g): **406.22**

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):	
Reading 1:	3.98	Reading 1:	1.98
Reading 2:	3.98	Reading 2:	1.94
Reading 3:	3.98	Average:	**1.96**
Average:	**3.98**	Area (in^2):	3.02
		L/D:	2.03

MOISTURE CONTENT			
Tare Number:	3132	Total Load (lb):	90
Wt. of Tare & Wet Sample (g):	390.99	**Uniaxial Compressive Strength (psi):**	**30**
Wt. of Tare & Dry Sample (g):	350.92		
Weight of Tare (g):	8.12	Fracture Type:	**Crumble**
Weight of Wet Sample (g):	382.87		
Sample Volume (cm^3):	196.95	Rate of Loading (lb/sec):	2
Moisture Content (%):	11.69	Time to Break (min:sec):	0:48.11
Unit Wet Weight (g/cm^3):	2.063	Deviation From Straightness^3:	
Unit Wet Weight (pcf):	128.7		
Unit Dry Weight (g/cm^3):	1.847		
Unit Dry Weight (pcf):	115.2		

AXIAL: *Fail* TOP: *Fail* BOTTOM: *Fail*

Physical Description: Rock Core

Notes:
1) Moisture conditions at time of the test are: As Received-Unpreserved
2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
3) Deviation from straightness, Procedure A of ASTM D 4543-08
   Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
4) Temperature is laboratory room temperature.
5) D4543 Prep and D7012 Testing Equipment Used:
6) Tool / Machine List:
   G788 Compression Machine
   G1661 Digital Calipers, G1380 Dial Gauge
   G1616 Straight Edge, G1571 Feeler Gauge
   G1633 V-Block, G1634 Rock Saw, G1635 Grinder

Tested By: JAC Date: 3/9/21 *Checked By:* NJM *Date:* 3/11/21

UNCONFINED COMPRESSION STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C
This method does not report strain rate or deformation.
Sample Prep and Conformance Verification: ASTM D 4543-08

Client: GAI Consultants, Inc.
Client Project: ACAA RSA C191167.00
Project No.: 2021-145-001
Lab ID No.: 2021-145-001-010

Boring No.: B-9
Depth (ft): 20.0-20.7
Sample ID: R-2
Moisture Condition: As Received-Unpreserved

Specimen Weight (g): 425.78

SPECIMEN LENGTH (in)	
Reading 1:	3.85
Reading 2:	3.85
Reading 3:	3.85
Average:	**3.85**

SPECIMEN DIAMETER (in):	
Reading 1:	1.99
Reading 2:	1.99
Average:	**1.99**
Area (in^2):	3.10
L/D:	1.94

MOISTURE CONTENT	
Tare Number:	3385
Wt. of Tare & Wet Sample (g):	432.82
Wt. of Tare & Dry Sample (g):	374.43
Weight of Tare (g):	8.12
Weight of Wet Sample (g):	424.70
Sample Volume (cm^3):	195.98
Moisture Content (%):	15.94
Unit Wet Weight (g/cm^3):	2.173
Unit Wet Weight (pcf):	135.6
Unit Dry Weight (g/cm^3):	1.874
Unit Dry Weight (pcf):	116.9

Total Load (lb): 310
Uniaxial Compressive Strength (psi): 100

Fracture Type: **Split**

Rate of Loading (lb/sec): 3
Time to Break (min:sec): 2:00.19
Deviation From Straightness[3]:

AXIAL: *Fail* TOP: *Pass* BOTTOM: *Pass*

Physical Description: Rock Core

Notes:

1) Moisture conditions at time of the test are: As Received-Unpreserved
2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
3) Deviation from straightness, Procedure A of ASTM D 4543-08
   Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
4) Temperature is laboratory room temperature.
5) D4543 Prep and D7012 Testing Equipment Used:
6) Tool / Machine List:
   G788 Compression Machine
   G1661 Digital Calipers, G1380 Dial Gauge
   G1616 Straight Edge, G1571 Feeler Gauge
   G1633 V-Block, G1634 Rock Saw, G1635 Grinder

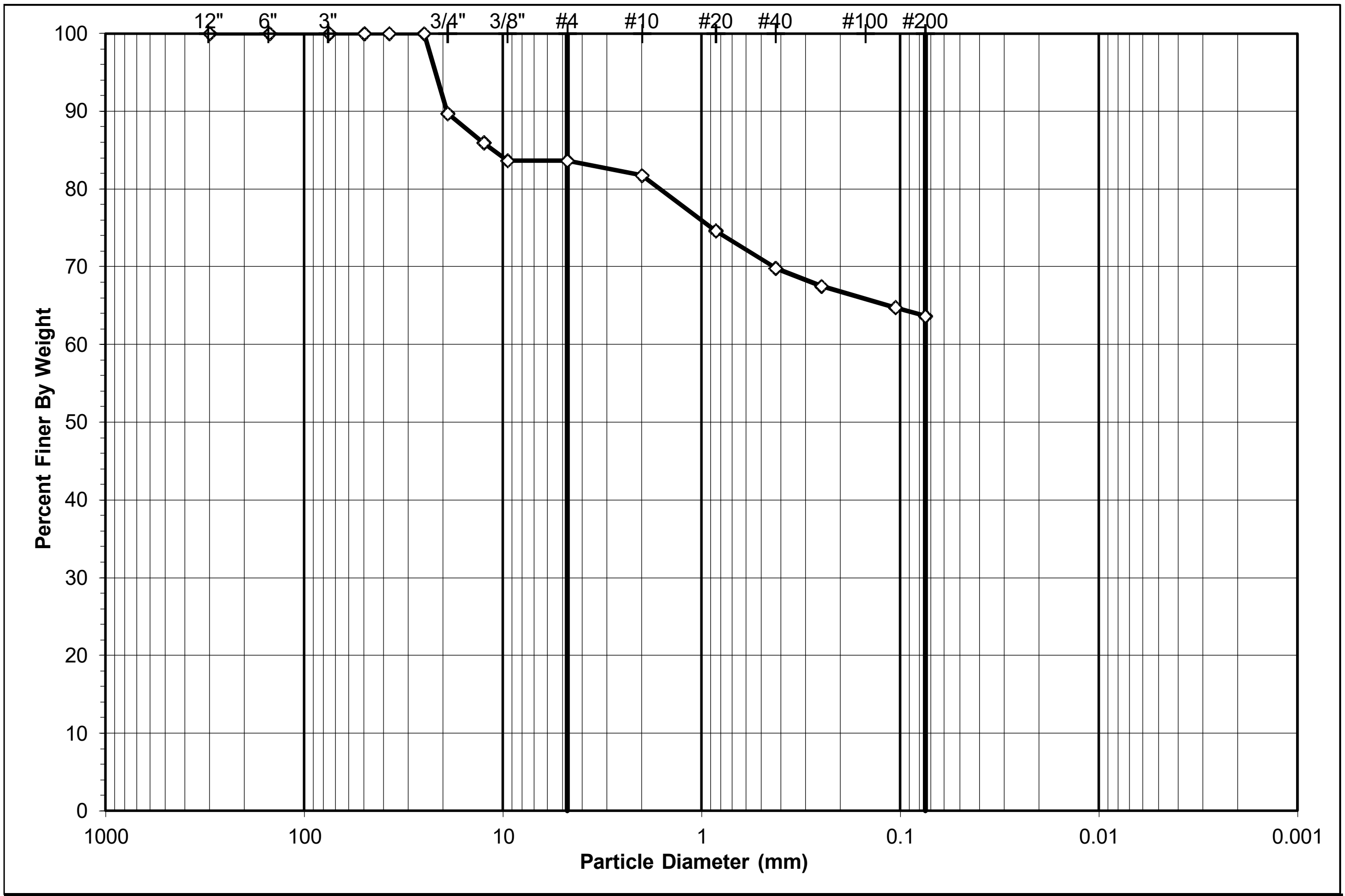
Tested By: JAC Date: 3/9/21 *Checked By:* NJM *Date:* 3/11/21

SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-3
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-3.7'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-011	Soil Color:	Brown

	SIEVE ANALYSIS			*HYDROMETER*	
USCS	**cobbles**	**gravel**	**sand**	**silt and clay fraction**	
USDA	**cobbles**	**gravel**	**sand**	**silt**	**clay**



USCS Summary

Sieve Size (mm)		**Percentage (%)**
Greater Than #4	*Gravel*	16.36
#4 to #200	*Sand*	19.99
Finer Than #200	*Silt & Clay*	63.64

USCS Symbol:

CL, TESTED

USCS Classification:

SANDY LEAN CLAY WITH GRAVEL

WASH SIEVE ANALYSIS

ASTM D 422-63 (2007)

Client:	GAI Consultants, Inc.	Boring No.:	B-3
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-3.7'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-011	Soil Color:	Brown

Moisture Content of Passing 3/4" Material		Moisture Content of Retained 3/4" Material	
Tare No.:	1499	Tare No.:	NA
Wt. of Tare & Wet Sample (g):	295.95	Weight of Tare & Wet Sample (g):	NA
Wt. of Tare & Dry Sample (g):	295.95	Weight of Tare & Dry Sample (g):	NA
Weight of Tare (g):	148.13	Weight of Tare (g):	NA
Weight of Water (g):	0.00	Weight of Water (g):	NA
Weight of Dry Soil (g):	147.82	Weight of Dry Soil (g):	NA
Moisture Content (%):	**0.0**	**Moisture Content (%):**	**0.0**

Wet Weight of -3/4" Sample (g):	NA	Weight of the Dry Sample (g):	147.82
Dry Weight of - 3/4" Sample (g)	132.60	Weight of Minus #200 Material (g):	94.08
Wet Weight of +3/4" Sample (g)	15.22	Weight of Plus #200 Material (g):	53.74
Dry Weight of + 3/4" Sample (g)	15.22		
Total Dry Weight of Sample (g):	147.82		

Sieve Size	Sieve Opening (mm)	Weight of Soil Retained (g)		Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00		0.00	0.00	100.00	**100.00**
6"	150	0.00		0.00	0.00	100.00	**100.00**
3"	75	0.00		0.00	0.00	100.00	**100.00**
2"	50	0.00	(*)	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00		0.00	0.00	100.00	**100.00**
1"	25.0	0.00		0.00	0.00	100.00	**100.00**
3/4"	19.0	15.22		10.30	10.30	89.70	**89.70**
1/2"	12.5	5.54		3.75	14.04	85.96	**85.96**
3/8"	9.50	3.43		2.32	16.36	83.64	**83.64**
#4	4.75	0.00		0.00	16.36	83.64	**83.64**
#10	2.00	2.79		1.89	18.25	81.75	**81.75**
#20	0.85	10.52	(**)	7.12	25.37	74.63	**74.63**
#40	0.425	7.13		4.82	30.19	69.81	**69.81**
#60	0.250	3.42		2.31	32.51	67.49	**67.49**
#140	0.106	4.03		2.73	35.23	64.77	**64.77**
#200	0.075	1.66		1.12	36.36	63.64	**63.64**
Pan	-	94.08		63.64	100.00	-	-

Notes : *(*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample*
*(**) The - 3/4" sieve analysis is based on the Weight of the Dry Sample*

Tested By NR Date 3/16/21 Checked By JLK Date 3/18/21

ATTERBERG LIMITS

ASTM D 4318-17

Client:	GAI Consultants, Inc.	Boring No.:	B-3
Client Reference:	ACAA RSA C191167.00	Depth (ft):	3.0-3.7'
Project No.:	2021-145-001	Sample No.:	S-2
Lab ID:	2021-145-001-011	Soil Description:	BROWN LEAN CLAY

***Note: The* USCS *symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description*.** (Minus #40 sieve material, Air dried)

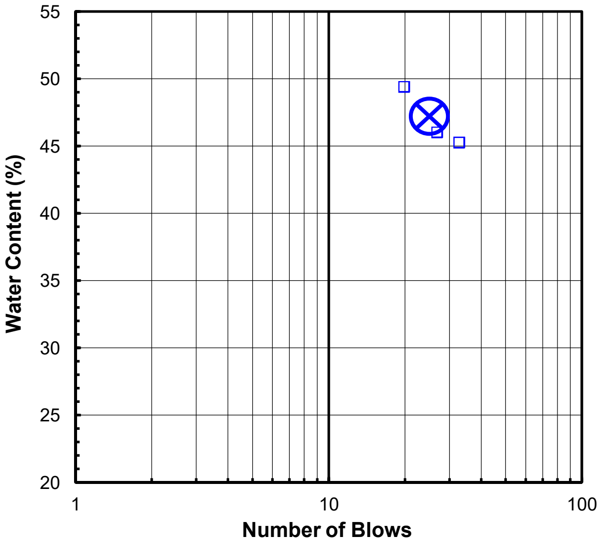
As Received Moisture Content ASTM D2216-19		Liquid Limit Test 1	2	3	M
Tare Number:	29	114	577	2224	U
Wt. of Tare & Wet Sample (g):	34.37	38.53	40.43	39.79	L
Wt. of Tare & Dry Sample (g):	30.33	32.27	34.12	33.08	T
Weight of Tare (g):	8.56	18.42	20.39	19.48	I
Weight of Water (g):	4.0	6.3	6.3	6.7	P
Weight of Dry Sample (g):	21.8	13.9	13.7	13.6	O
Was As Received MC Preserved:	**Yes**				I
Moisture Content (%):	**18.6**	**45.2**	**46.0**	**49.3**	N
Number of Blows:		**33**	**27**	**20**	T

Plastic Limit Test	1	2	Range
Tare Number:	509	307	
Wt. of Tare & Wet Sample (g):	25.61	25.56	
Wt. of Tare & Dry Sample (g):	24.47	24.47	
Weight of Tare (g):	19.39	19.42	
Weight of Water (g):	1.1	1.1	
Weight of Dry Sample (g):	5.1	5.1	
Moisture Content (%):	**22.4**	**21.6**	**0.9**

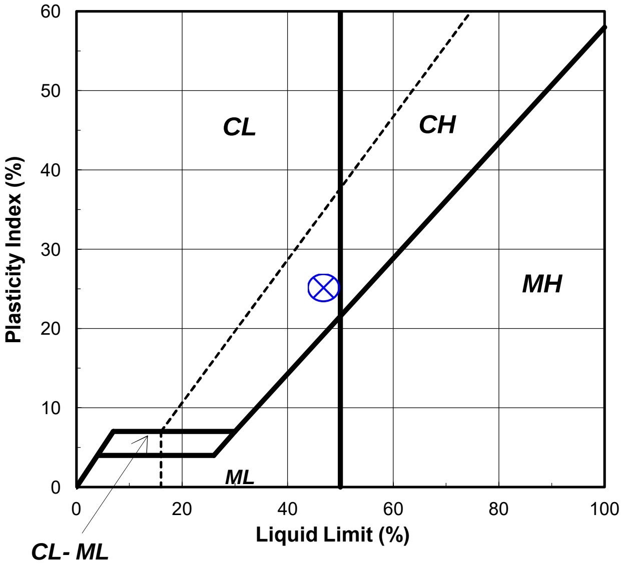
Note: The acceptable range of the two Moisture Contents is ± 1.12

Test Results	
Liquid Limit (%):	**47**
Plastic Limit (%):	**22**
Plasticity Index (%):	**25**
USCS Symbol:	**CL**

Flow Curve



Plasticity Chart



Tested By *FS* *Date* *3/13/21* *Checked By* *JLK* *Date* 3/16/21

APPENDIX C

Soil and Groundwater Analytical Laboratory Results

2019 Ninth Avenue
PO Box 1925
Altoona, PA 16603
(814) 946-4306

NELAP: PA 07-062, VA 460212

State Certifications: MD 275, WV 364

FAIRWAY LABORATORIES

www.fairwaylaboratories.com

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled	Date Received
B-4-1	1C02026-01	Solid	Grab	02/24/21 14:27	03/01/21 17:20
B-4-2	1C02026-02	Solid	Grab	02/24/21 14:40	03/01/21 17:20
B-4-3	1C02026-03	Water	Grab	03/01/21 14:02	03/01/21 17:20
B-5-1	1C02026-04	Water	Grab	03/01/21 14:55	03/01/21 17:20
B-7-1	1C02026-05	Solid	Grab	02/26/21 11:03	03/01/21 17:20
B-7-2	1C02026-06	Solid	Grab	02/26/21 11:20	03/01/21 17:20
B-8-1	1C02026-07	Solid	Grab	02/24/21 10:33	03/01/21 17:20
B-8-2	1C02026-08	Solid	Grab	02/24/21 10:50	03/01/21 17:20
B-9-1	1C02026-09	Solid	Grab	03/01/21 11:23	03/01/21 17:20
B-9-2	1C02026-10	Solid	Grab	03/01/21 11:39	03/01/21 17:20

Fairway Laboratories, Inc.

Reviewed and Submitted by:

Michael P. Tyler
Laboratory Director

Fairway Labs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-1**

Date/Time Sampled: 02/24/21 14:27

Laboratory Sample ID: **1C02026-01 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	81.7		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0390		0.0390	mg/kg dry	03/08/21 19:04	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<2.05		2.05	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Aluminum	27900		51.3	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	T
Arsenic	5.63		4.11	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Barium	152		5.13	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	
Beryllium	<1.03		1.03	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Calcium	2270		103	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	
Cadmium	<2.05		2.05	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Cobalt	15.1		5.13	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	

GAI Consultants-Homestead		Project:	AGC RSA	
385 East Waterfront Dr.		Project Number:	[none]	**Reported:**
Homestead PA, 15120		Collector:	CLIENT	03/22/21 16:36
Project Manager:	Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-4-1** **Date/Time Sampled:** 02/24/21 14:27

Laboratory Sample ID: **1C02026-01 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	33.1		2.57	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Copper	19.3		5.13	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Iron	36700		20.5	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	T
Potassium	2700		103	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	
Magnesium	8120		103	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	
Manganese	448		5.13	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Sodium	<513		513	mg/kg dry	03/08/21 18:40	EPA 6010B/2.0	seg	
Nickel	32.6		25.7	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Lead	16.8		4.11	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Antimony	<5.13		5.13	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Selenium	<10.3		10.3	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-4-1 **Date/Time Sampled:** 02/24/21 14:27

Laboratory Sample ID: 1C02026-01 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<10.3		10.3	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Vanadium	45.4		10.3	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Zinc	78.0		10.3	mg/kg dry	03/08/21 18:42	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	
PCB-1221	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	
PCB-1232	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	
PCB-1242	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	
PCB-1248	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	
PCB-1254	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	
PCB-1260	<0.011		0.011	mg/kg dry	03/09/21 01:12	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*105 %*	*38.1-152*		*03/09/21 01:12*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*183 %*	*21.7-147*		*03/09/21 01:12*	*EPA 8082A*	cdb	O
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Acenaphthylene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-1** **Date/Time Sampled:** 02/24/21 14:27

Laboratory Sample ID: **1C02026-01 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Anthracene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Benzo (a) anthracene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Benzo (a) pyrene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Chrysene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Naphthalene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Fluoranthene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Fluorene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Phenanthrene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Pyrene	<0.405		0.405	mg/kg dry	03/04/21 14:36	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*115 %*	*50.9-136*		*03/04/21 14:36*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*114 %*	*51.9-130*		*03/04/21 14:36*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*116 %*	*42.5-120*		*03/04/21 14:36*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*112 %*	*48.9-115*		*03/04/21 14:36*	*EPA 8270D*	cdb	
Surrogate: 2,4,6-Tribromophenol		*112 %*	*46-153*		*03/04/21 14:36*	*EPA 8270D*	cdb	

GAI Consultants-Homestead	Project:	AGC RSA		
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**	
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36	
Project Manager: Edward Sciulli	Number of Containers:	52		

Client Sample ID: B-4-1 **Date/Time Sampled:** 02/24/21 14:27

Laboratory Sample ID: 1C02026-01 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*123 %*	*50.5-121*		*03/04/21 14:36*	*EPA 8270D*	cdb	O
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
Benzene	<0.0016		0.0016	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Toluene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Ethylbenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Xylenes (total)	<0.0080		0.0080	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Isopropylbenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Bromodichloromethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Bromoform	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Bromomethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
2-Butanone	0.0179		0.0080	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Carbon disulfide	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Carbon tetrachloride	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Chlorobenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Chloroethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Chloroform	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Chloromethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-1**

Date/Time Sampled: 02/24/21 14:27

Laboratory Sample ID: **1C02026-01 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
1,2-Dibromo-3-chloropropane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	F
Dibromochloromethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0016		0.0016	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0016		0.0016	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
2-Hexanone	<0.0080		0.0080	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Methylene chloride	<0.0161		0.0161	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
4-Methyl-2-pentanone	<0.0080		0.0080	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-1** **Date/Time Sampled:** 02/24/21 14:27

Laboratory Sample ID: **1C02026-01 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
Styrene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Tetrachloroethene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Trichloroethene	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0040		0.0040	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Vinyl chloride	<0.0016		0.0016	mg/kg dry	03/04/21 15:00	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*102 %*	*70-130*		*03/04/21 15:00*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*105 %*	*70-130*		*03/04/21 15:00*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*102 %*	*70-130*		*03/04/21 15:00*	*EPA 8260B*	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-1**

Date/Time Sampled: 02/24/21 14:27

Laboratory Sample ID: **1C02026-01RE1 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
Acetone	<0.907		0.907	mg/kg dry	03/09/21 11:47	EPA 8260B	JMG	D, F

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-4-2** **Date/Time Sampled:** 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	89.9		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0325		0.0325	mg/kg dry	03/08/21 19:06	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<1.90		1.90	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Aluminum	22900		47.5	mg/kg dry	03/08/21 18:47	EPA 6010B/2.0	seg	T
Arsenic	<3.80		3.80	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Barium	95.7		4.75	mg/kg dry	03/08/21 18:47	EPA 6010B/2.0	seg	
Beryllium	1.18		0.950	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Calcium	18900		95.0	mg/kg dry	03/08/21 18:47	EPA 6010B/2.0	seg	T
Cadmium	<1.90		1.90	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Cobalt	21.9		4.75	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-2**

Date/Time Sampled: 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Metals by Prep Method EPA 3050B

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Chromium	29.5		2.37	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Copper	33.7		4.75	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Iron	97300		380	mg/kg dry	03/09/21 18:36	EPA 6010B/2.0	seg	T
Potassium	2730		95.0	mg/kg dry	03/08/21 18:47	EPA 6010B/2.0	seg	
Magnesium	12400		95.0	mg/kg dry	03/08/21 18:47	EPA 6010B/2.0	seg	T
Manganese	3420		4.75	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	T
Sodium	<475		475	mg/kg dry	03/08/21 18:47	EPA 6010B/2.0	seg	
Nickel	51.2		23.7	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Lead	13.8		3.80	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Antimony	<4.75		4.75	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Selenium	<9.50		9.50	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-4-2** **Date/Time Sampled:** 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<9.50		9.50	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Vanadium	51.2		9.50	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Zinc	128		9.50	mg/kg dry	03/08/21 18:49	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	
PCB-1221	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	
PCB-1232	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	
PCB-1242	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	
PCB-1248	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	
PCB-1254	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	
PCB-1260	<0.011		0.011	mg/kg dry	03/09/21 01:43	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*99.1 %*	*38.1-152*		*03/09/21 01:43*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*139 %*	*21.7-147*		*03/09/21 01:43*	*EPA 8082A*	cdb	
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Acenaphthylene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-4-2** **Date/Time Sampled:** 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Anthracene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Benzo (a) anthracene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Benzo (a) pyrene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Chrysene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Naphthalene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Fluoranthene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Fluorene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Phenanthrene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Pyrene	<0.370		0.370	mg/kg dry	03/04/21 15:30	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*114 %*	*50.9-136*		*03/04/21 15:30*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*112 %*	*51.9-130*		*03/04/21 15:30*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*119 %*	*42.5-120*		*03/04/21 15:30*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*115 %*	*48.9-115*		*03/04/21 15:30*	*EPA 8270D*	cdb	
Surrogate: 2,4,6-Tribromophenol		*110 %*	*46-153*		*03/04/21 15:30*	*EPA 8270D*	cdb	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-4-2** **Date/Time Sampled:** 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*125 %*	*50.5-121*		*03/04/21 15:30*	*EPA 8270D*	cdb	O
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Benzene	0.0186		0.0019	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Toluene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Ethylbenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Xylenes (total)	<0.0094		0.0094	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Isopropylbenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Acetone	<0.0094		0.0094	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Bromodichloromethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Bromoform	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Bromomethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
2-Butanone	<0.0094		0.0094	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Carbon disulfide	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Carbon tetrachloride	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Chlorobenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Chloroethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Chloroform	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-2**

Date/Time Sampled: 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Chloromethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	F
Dibromochloromethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0019		0.0019	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0019		0.0019	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
2-Hexanone	<0.0094		0.0094	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Methylene chloride	<0.0187		0.0187	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-2** **Date/Time Sampled:** 02/24/21 14:40

Laboratory Sample ID: **1C02026-02 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
4-Methyl-2-pentanone	<0.0094		0.0094	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Styrene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Tetrachloroethene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Trichloroethene	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0047		0.0047	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Vinyl chloride	<0.0019		0.0019	mg/kg dry	03/04/21 15:25	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*102 %*	*70-130*		*03/04/21 15:25*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*106 %*	*70-130*		*03/04/21 15:25*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*103 %*	*70-130*		*03/04/21 15:25*	*EPA 8260B*	JMG	

GAI Consultants-Homestead	Project:	AGC RSA		
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**	
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36	
Project Manager: Edward Sciulli	Number of Containers:	52		

Client Sample ID: **B-4-3** **Date/Time Sampled:** 03/01/21 14:02

Laboratory Sample ID: **1C02026-03 (Water/Grab)**

Metals by EPA 245.1

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Mercury	<0.00100		0.00100	mg/l	03/03/21 21:27	EPA 245.1/3.0	cam	

Metals by Prep Method EPA 200.2

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Silver	<0.00400		0.00400	mg/l	03/05/21 22:49	EPA 200.7/4.4	seg	
Aluminum	9.50		0.100	mg/l	03/05/21 22:48	EPA 200.7/4.4	seg	
Arsenic	<0.00800		0.00800	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Barium	0.183		0.0200	mg/l	03/05/21 22:48	EPA 200.7/4.4	seg	
Beryllium	<0.00200		0.00200	mg/l	03/05/21 22:49	EPA 200.7/4.4	seg	
Calcium	91.4		0.500	mg/l	03/05/21 22:48	EPA 200.7/4.4	seg	T
Cadmium	<0.00400		0.00400	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Cobalt	<0.0100		0.0100	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Chromium	0.0138		0.00500	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Copper	0.0188		0.0100	mg/l	03/05/21 22:49	EPA 200.7/4.4	seg	
Iron	11.6		0.200	mg/l	03/05/21 22:48	EPA 200.7/4.4	seg	T
Potassium	4.36		0.400	mg/l	03/08/21 22:42	EPA 200.7/4.4	rjd	
Magnesium	31.9		0.200	mg/l	03/05/21 22:48	EPA 200.7/4.4	seg	T
Manganese	0.322		0.0200	mg/l	03/05/21 22:49	EPA 200.7/4.4	seg	
Sodium	18.3		1.00	mg/l	03/05/21 22:48	EPA 200.7/4.4	seg	
Nickel	<0.0500		0.0500	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-4-3 **Date/Time Sampled:** 03/01/21 14:02

Laboratory Sample ID: 1C02026-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 200.2								
Lead	0.00990		0.00800	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Antimony	<0.0100		0.0100	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Selenium	<0.0200		0.0200	mg/l	03/08/21 22:40	EPA 200.7/4.4	rjd	
Thallium	<0.0200		0.0200	mg/l	03/05/21 22:50	EPA 200.7/4.4	seg	
Vanadium	0.0287		0.0200	mg/l	03/05/21 22:49	EPA 200.7/4.4	seg	
Zinc	0.0391		0.0200	mg/l	03/08/21 22:40	EPA 200.7/4.4	rjd	
Polychlorinated Biphenyls by EPA Extraction Method 3510C								
PCB-1016	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	
PCB-1221	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	
PCB-1232	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	
PCB-1242	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	
PCB-1248	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	
PCB-1254	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	F
PCB-1260	<0.0500		0.0500	ug/l	03/10/21 18:58	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*53.4 %*	*10-109*		*03/10/21 18:58*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*66.3 %*	*10-110*		*03/10/21 18:58*	*EPA 8082A*	cdb	
Semivolatile Organic Compounds by EPA Extraction Method 3510C								
Acenaphthene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-3**

Date/Time Sampled: 03/01/21 14:02

Laboratory Sample ID: **1C02026-03 (Water/Grab)**

Semivolatile Organic Compounds by EPA Extraction Method 3510C

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Acenaphthylene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Anthracene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Benzo (a) anthracene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Benzo (b) fluoranthene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Benzo (k) fluoranthene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Benzo (a) pyrene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Chrysene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Naphthalene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Fluoranthene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Fluorene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Phenanthrene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Pyrene	<5.00		5.00	ug/l	03/04/21 09:43	EPA 8270D	cdb	
Surrogate: Nitrobenzene-d5		*105 %*	*20.3-91.4*		*03/04/21 09:43*	*EPA 8270D*	cdb	O
Surrogate: 2-Fluorobiphenyl		*104 %*	*27.2-101*		*03/04/21 09:43*	*EPA 8270D*	cdb	O
Surrogate: Terphenyl-d14		*56.4 %*	*53.5-102*		*03/04/21 09:43*	*EPA 8270D*	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported: 03/22/21 16:36

Client Sample ID: **B-4-3** **Date/Time Sampled:** 03/01/21 14:02

Laboratory Sample ID: **1C02026-03 (Water/Grab)**

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Benzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Toluene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Ethylbenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Xylenes (total)	<2.00		2.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Isopropylbenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Methyl tert-butyl ether	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Acetone	820		500	ug/l	03/08/21 19:25	EPA 8260B	MTC	Q
Bromodichloromethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Bromoform	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Bromomethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
2-Butanone	652		500	ug/l	03/08/21 19:25	EPA 8260B	MTC	Q
Carbon disulfide	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Carbon tetrachloride	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Chlorobenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Chloroethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Chloroform	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Chloromethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,2-Dibromo-3-chloropropane	<5.00		5.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-4-3**

Date/Time Sampled: 03/01/21 14:02

Laboratory Sample ID: **1C02026-03 (Water/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B								
Dibromochloromethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,2-Dibromoethane (EDB)	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,2-Dichlorobenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,4-Dichlorobenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,3-Dichlorobenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Dichlorodifluoromethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,2-Dichloroethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,1-Dichloroethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
trans-1,2-Dichloroethene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
cis-1,2-Dichloroethene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,1-Dichloroethene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,2-Dichloropropane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
trans-1,3-Dichloropropene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
cis-1,3-Dichloropropene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
2-Hexanone	<10.0		10.0	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Methylene chloride	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
4-Methyl-2-pentanone	<10.0		10.0	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Styrene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-4-3** **Date/Time Sampled:** 03/01/21 14:02

Laboratory Sample ID: **1C02026-03 (Water/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B								
1,1,2,2-Tetrachloroethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Tetrachloroethene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,2,4-Trichlorobenzene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,1,1-Trichloroethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
1,1,2-Trichloroethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Trichloroethene	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Trichlorofluoromethane	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Vinyl chloride	<1.00		1.00	ug/l	03/05/21 17:38	EPA 8260B	MTC	
Surrogate: 4-Bromofluorobenzene		*97.6 %*	*70-130*		*03/05/21 17:38*	*EPA 8260B*	MTC	
Surrogate: 1,2-Dichloroethane-d4		*105 %*	*70-130*		*03/05/21 17:38*	*EPA 8260B*	MTC	
Surrogate: Fluorobenzene		*99.5 %*	*70-130*		*03/05/21 17:38*	*EPA 8260B*	MTC	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: B-5-1 **Date/Time Sampled:** 03/01/21 14:55

Laboratory Sample ID: 1C02026-04 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by EPA 245.1								
Mercury	<0.00100		0.00100	mg/l	03/03/21 21:29	EPA 245.1/3.0	cam	
Metals by Prep Method EPA 200.2								
Silver	<0.00400		0.00400	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Aluminum	17.0		0.100	mg/l	03/08/21 22:47	EPA 200.7/4.4	rjd	T
Arsenic	<0.00800		0.00800	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Barium	0.299		0.0200	mg/l	03/08/21 22:47	EPA 200.7/4.4	rjd	
Beryllium	<0.00200		0.00200	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Calcium	205		0.500	mg/l	03/08/21 22:47	EPA 200.7/4.4	rjd	T
Cadmium	<0.00400		0.00400	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Cobalt	0.0241		0.0100	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Chromium	0.117		0.00500	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Copper	0.0383		0.0100	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Iron	18.1		0.200	mg/l	03/08/21 22:47	EPA 200.7/4.4	rjd	T
Potassium	10.3		0.400	mg/l	03/08/21 22:51	EPA 200.7/4.4	rjd	
Magnesium	56.6		0.200	mg/l	03/08/21 22:47	EPA 200.7/4.4	rjd	T
Manganese	0.865		0.0200	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Sodium	6.34		1.00	mg/l	03/08/21 22:47	EPA 200.7/4.4	rjd	
Nickel	<0.0500		0.0500	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-5-1** **Date/Time Sampled:** 03/01/21 14:55

Laboratory Sample ID: **1C02026-04 (Water/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 200.2								
Lead	0.0333		0.00800	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Antimony	<0.0100		0.0100	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Selenium	<0.0200		0.0200	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Thallium	<0.0200		0.0200	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Vanadium	0.0329		0.0200	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Zinc	0.138		0.0200	mg/l	03/08/21 22:49	EPA 200.7/4.4	rjd	
Polychlorinated Biphenyls by EPA Extraction Method 3510C								
PCB-1016	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	
PCB-1221	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	
PCB-1232	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	
PCB-1242	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	
PCB-1248	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	
PCB-1254	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	F
PCB-1260	<0.0500		0.0500	ug/l	03/10/21 19:28	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*62.0 %*	*10-109*		*03/10/21 19:28*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*44.0 %*	*10-110*		*03/10/21 19:28*	*EPA 8082A*	cdb	
Semivolatile Organic Compounds by EPA Extraction Method 3510C								
Acenaphthene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: B-5-1 **Date/Time Sampled:** 03/01/21 14:55

Laboratory Sample ID: 1C02026-04 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3510C								
Acenaphthylene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Anthracene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Benzo (a) anthracene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Benzo (b) fluoranthene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Benzo (k) fluoranthene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Benzo (a) pyrene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Chrysene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Naphthalene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Fluoranthene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Fluorene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Phenanthrene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Pyrene	<5.00		5.00	ug/l	03/04/21 10:10	EPA 8270D	cdb	
Surrogate: Nitrobenzene-d5		*74.2 %*	*20.3-91.4*		*03/04/21 10:10*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*72.0 %*	*27.2-101*		*03/04/21 10:10*	*EPA 8270D*	cdb	
Surrogate: Terphenyl-d14		*41.0 %*	*53.5-102*		*03/04/21 10:10*	*EPA 8270D*	cdb	P

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-5-1**

Date/Time Sampled: 03/01/21 14:55

Laboratory Sample ID: **1C02026-04 (Water/Grab)**

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Benzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Toluene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Ethylbenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Xylenes (total)	<2.00		2.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Isopropylbenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Methyl tert-butyl ether	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Acetone	<10.0		10.0	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Bromodichloromethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Bromoform	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Bromomethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
2-Butanone	<10.0		10.0	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Carbon disulfide	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Carbon tetrachloride	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Chlorobenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Chloroethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Chloroform	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Chloromethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,2-Dibromo-3-chloropropane	<5.00		5.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-5-1**

Date/Time Sampled: 03/01/21 14:55

Laboratory Sample ID: **1C02026-04 (Water/Grab)**

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Dibromochloromethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,2-Dibromoethane (EDB)	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,2-Dichlorobenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,4-Dichlorobenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,3-Dichlorobenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Dichlorodifluoromethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,2-Dichloroethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,1-Dichloroethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
trans-1,2-Dichloroethene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
cis-1,2-Dichloroethene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,1-Dichloroethene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,2-Dichloropropane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
trans-1,3-Dichloropropene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
cis-1,3-Dichloropropene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
2-Hexanone	<10.0		10.0	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Methylene chloride	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
4-Methyl-2-pentanone	<10.0		10.0	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Styrene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-5-1** **Date/Time Sampled:** 03/01/21 14:55

Laboratory Sample ID: **1C02026-04 (Water/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B								
1,1,2,2-Tetrachloroethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Tetrachloroethene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,2,4-Trichlorobenzene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,1,1-Trichloroethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
1,1,2-Trichloroethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Trichloroethene	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Trichlorofluoromethane	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Vinyl chloride	<1.00		1.00	ug/l	03/05/21 18:18	EPA 8260B	MTC	
Surrogate: 4-Bromofluorobenzene		*94.6 %*	*70-130*		*03/05/21 18:18*	*EPA 8260B*	MTC	
Surrogate: 1,2-Dichloroethane-d4		*106 %*	*70-130*		*03/05/21 18:18*	*EPA 8260B*	MTC	
Surrogate: Fluorobenzene		*100 %*	*70-130*		*03/05/21 18:18*	*EPA 8260B*	MTC	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: B-7-1

Date/Time Sampled: 02/26/21 11:03

Laboratory Sample ID: 1C02026-05 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	80.8		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0366		0.0366	mg/kg dry	03/08/21 19:08	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<2.26		2.26	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Aluminum	3720		56.6	mg/kg dry	03/08/21 18:54	EPA 6010B/2.0	seg	
Arsenic	<4.52		4.52	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Barium	78.9		5.66	mg/kg dry	03/08/21 18:54	EPA 6010B/2.0	seg	
Beryllium	<1.13		1.13	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Calcium	264000		2260	mg/kg dry	03/09/21 18:43	EPA 6010B/2.0	seg	
Cadmium	<2.26		2.26	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Cobalt	<5.66		5.66	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-7-1 **Date/Time Sampled:** 02/26/21 11:03

Laboratory Sample ID: 1C02026-05 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	4.60		2.83	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Copper	14.4		5.66	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Iron	10100		22.6	mg/kg dry	03/08/21 18:53	EPA 6010B/2.0	seg	T
Potassium	1690		113	mg/kg dry	03/08/21 18:53	EPA 6010B/2.0	seg	
Magnesium	48800		113	mg/kg dry	03/08/21 18:53	EPA 6010B/2.0	seg	T
Manganese	666		5.66	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Sodium	<566		566	mg/kg dry	03/08/21 18:53	EPA 6010B/2.0	seg	
Nickel	<28.3		28.3	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Lead	<4.52		4.52	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Antimony	<5.66		5.66	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Selenium	<11.3		11.3	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: B-7-1 **Date/Time Sampled:** 02/26/21 11:03

Laboratory Sample ID: 1C02026-05 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<11.3		11.3	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Vanadium	20.9		11.3	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Zinc	15.5		11.3	mg/kg dry	03/08/21 18:55	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	
PCB-1221	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	
PCB-1232	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	
PCB-1242	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	
PCB-1248	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	
PCB-1254	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	
PCB-1260	<0.012		0.012	mg/kg dry	03/09/21 02:13	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*101 %*	*38.1-152*		*03/09/21 02:13*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*156 %*	*21.7-147*		*03/09/21 02:13*	*EPA 8082A*	cdb	O
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Acenaphthylene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-7-1**

Date/Time Sampled: 02/26/21 11:03

Laboratory Sample ID: **1C02026-05 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Anthracene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Benzo (a) anthracene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Benzo (a) pyrene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Chrysene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Naphthalene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Fluoranthene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Fluorene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Phenanthrene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Pyrene	<0.403		0.403	mg/kg dry	03/04/21 15:56	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*116 %*	*50.9-136*		*03/04/21 15:56*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*114 %*	*51.9-130*		*03/04/21 15:56*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*124 %*	*42.5-120*		*03/04/21 15:56*	*EPA 8270D*	cdb	O
Surrogate: 2-Fluorobiphenyl		*124 %*	*48.9-115*		*03/04/21 15:56*	*EPA 8270D*	cdb	O
Surrogate: 2,4,6-Tribromophenol		*112 %*	*46-153*		*03/04/21 15:56*	*EPA 8270D*	cdb	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-7-1** **Date/Time Sampled:** 02/26/21 11:03

Laboratory Sample ID: **1C02026-05 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*134 %*	*50.5-121*		*03/04/21 15:56*	*EPA 8270D*	cdb	O I5
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Benzene	0.0059		0.0014	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Toluene	0.0063		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Ethylbenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Xylenes (total)	<0.0069		0.0069	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Isopropylbenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Acetone	<0.0069		0.0069	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Bromodichloromethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Bromoform	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Bromomethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
2-Butanone	<0.0069		0.0069	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Carbon disulfide	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Carbon tetrachloride	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Chlorobenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Chloroethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Chloroform	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	

Client Sample ID: B-7-1 **Date/Time Sampled:** 02/26/21 11:03

Laboratory Sample ID: 1C02026-05 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
Chloromethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	F
Dibromochloromethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0014		0.0014	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0014		0.0014	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
2-Hexanone	<0.0069		0.0069	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Methylene chloride	<0.0137		0.0137	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-7-1**

Date/Time Sampled: 02/26/21 11:03

Laboratory Sample ID: **1C02026-05 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
4-Methyl-2-pentanone	<0.0069		0.0069	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Styrene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Tetrachloroethene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Trichloroethene	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0034		0.0034	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Vinyl chloride	<0.0014		0.0014	mg/kg dry	03/04/21 15:49	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*104 %*	*70-130*		*03/04/21 15:49*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*107 %*	*70-130*		*03/04/21 15:49*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*101 %*	*70-130*		*03/04/21 15:49*	*EPA 8260B*	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-7-2** **Date/Time Sampled:** 02/26/21 11:20

Laboratory Sample ID: **1C02026-06 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	83.8		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0323		0.0323	mg/kg dry	03/08/21 19:10	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<2.11		2.11	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Aluminum	5960		52.6	mg/kg dry	03/08/21 19:01	EPA 6010B/2.0	seg	T
Arsenic	<4.21		4.21	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Barium	77.1		5.26	mg/kg dry	03/08/21 19:01	EPA 6010B/2.0	seg	
Beryllium	<1.05		1.05	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Calcium	263000		2110	mg/kg dry	03/09/21 18:49	EPA 6010B/2.0	seg	
Cadmium	<2.11		2.11	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Cobalt	<5.26		5.26	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-7-2** **Date/Time Sampled:** 02/26/21 11:20

Laboratory Sample ID: **1C02026-06 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	7.67		2.63	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Copper	14.5		5.26	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Iron	9470		21.1	mg/kg dry	03/08/21 19:00	EPA 6010B/2.0	seg	T
Potassium	2720		105	mg/kg dry	03/08/21 19:00	EPA 6010B/2.0	seg	
Magnesium	47900		105	mg/kg dry	03/08/21 19:00	EPA 6010B/2.0	seg	T
Manganese	635		5.26	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Sodium	<526		526	mg/kg dry	03/08/21 19:00	EPA 6010B/2.0	seg	
Nickel	<26.3		26.3	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Lead	<4.21		4.21	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Antimony	<5.26		5.26	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Selenium	<10.5		10.5	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-7-2 **Date/Time Sampled:** 02/26/21 11:20

Laboratory Sample ID: 1C02026-06 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<10.5		10.5	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Vanadium	22.6		10.5	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Zinc	16.0		10.5	mg/kg dry	03/08/21 19:02	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	
PCB-1221	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	
PCB-1232	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	
PCB-1242	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	
PCB-1248	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	
PCB-1254	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	
PCB-1260	<0.011		0.011	mg/kg dry	03/09/21 02:43	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*97.3 %*	*38.1-152*		*03/09/21 02:43*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*145 %*	*21.7-147*		*03/09/21 02:43*	*EPA 8082A*	cdb	
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Acenaphthylene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-7-2**

Date/Time Sampled: 02/26/21 11:20

Laboratory Sample ID: **1C02026-06 (Solid/Grab)**

Semivolatile Organic Compounds by EPA Extraction Method 3541

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Anthracene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Benzo (a) anthracene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Benzo (a) pyrene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Chrysene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Naphthalene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Fluoranthene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Fluorene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Phenanthrene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Pyrene	<0.396		0.396	mg/kg dry	03/04/21 16:23	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*113 %*	*50.9-136*		*03/04/21 16:23*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*112 %*	*51.9-130*		*03/04/21 16:23*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*116 %*	*42.5-120*		*03/04/21 16:23*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*114 %*	*48.9-115*		*03/04/21 16:23*	*EPA 8270D*	cdb	
Surrogate: 2,4,6-Tribromophenol		*108 %*	*46-153*		*03/04/21 16:23*	*EPA 8270D*	cdb	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-7-2** **Date/Time Sampled:** 02/26/21 11:20

Laboratory Sample ID: **1C02026-06 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*125 %*	*50.5-121*		*03/04/21 16:23*	*EPA 8270D*	cdb	O I5
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Benzene	<0.0013		0.0013	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Toluene	0.0043		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Ethylbenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Xylenes (total)	<0.0064		0.0064	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Isopropylbenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Acetone	<0.0064		0.0064	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Bromodichloromethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Bromoform	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Bromomethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
2-Butanone	<0.0064		0.0064	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Carbon disulfide	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Carbon tetrachloride	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Chlorobenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Chloroethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Chloroform	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-7-2**   **Date/Time Sampled:** 02/26/21 11:20

Laboratory Sample ID: **1C02026-06 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
Chloromethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	F
Dibromochloromethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0013		0.0013	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0013		0.0013	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
2-Hexanone	<0.0064		0.0064	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Methylene chloride	<0.0128		0.0128	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-7-2**

Date/Time Sampled: 02/26/21 11:20

Laboratory Sample ID: **1C02026-06 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								I5
4-Methyl-2-pentanone	<0.0064		0.0064	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Styrene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Tetrachloroethene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Trichloroethene	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0032		0.0032	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Vinyl chloride	<0.0013		0.0013	mg/kg dry	03/04/21 16:14	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*105 %*	*70-130*		*03/04/21 16:14*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*107 %*	*70-130*		*03/04/21 16:14*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*102 %*	*70-130*		*03/04/21 16:14*	*EPA 8260B*	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-1** **Date/Time Sampled:** 02/24/21 10:33

Laboratory Sample ID: **1C02026-07 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	85.5		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0371		0.0371	mg/kg dry	03/08/21 19:12	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<2.21		2.21	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Aluminum	14700		55.3	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	T
Arsenic	<4.42		4.42	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Barium	131		5.53	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	
Beryllium	<1.11		1.11	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Calcium	191000		111	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	T
Cadmium	<2.21		2.21	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Cobalt	6.68		5.53	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-1** **Date/Time Sampled:** 02/24/21 10:33

Laboratory Sample ID: **1C02026-07 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	15.7		2.76	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Copper	18.0		5.53	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Iron	14200		22.1	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	T
Potassium	4780		111	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	
Magnesium	32900		111	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	T
Manganese	560		5.53	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Sodium	<553		553	mg/kg dry	03/08/21 19:07	EPA 6010B/2.0	seg	
Nickel	<27.6		27.6	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Lead	6.47		4.42	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Antimony	<5.53		5.53	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Selenium	<11.1		11.1	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-8-1** **Date/Time Sampled:** 02/24/21 10:33

Laboratory Sample ID: **1C02026-07 (Solid/Grab)**

Metals by Prep Method EPA 3050B

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Thallium	<11.1		11.1	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Vanadium	34.2		11.1	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	
Zinc	35.5		11.1	mg/kg dry	03/08/21 19:09	EPA 6010B/2.0	seg	

Polychlorinated Biphenyls by EPA Extraction Method 3541

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
PCB-1016	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	
PCB-1221	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	
PCB-1232	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	
PCB-1242	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	
PCB-1248	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	
PCB-1254	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	
PCB-1260	<0.011		0.011	mg/kg dry	03/09/21 03:14	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*104 %*	*38.1-152*		*03/09/21 03:14*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*161 %*	*21.7-147*		*03/09/21 03:14*	*EPA 8082A*	cdb	O

Semivolatile Organic Compounds by EPA Extraction Method 3541

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Acenaphthene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Acenaphthylene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-8-1**

Date/Time Sampled: 02/24/21 10:33

Laboratory Sample ID: **1C02026-07 (Solid/Grab)**

Semivolatile Organic Compounds by EPA Extraction Method 3541

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Anthracene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Benzo (a) anthracene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Benzo (a) pyrene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Chrysene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Naphthalene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Fluoranthene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Fluorene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Phenanthrene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Pyrene	<0.387		0.387	mg/kg dry	03/04/21 16:49	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*107 %*	*50.9-136*		*03/04/21 16:49*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*105 %*	*51.9-130*		*03/04/21 16:49*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*115 %*	*42.5-120*		*03/04/21 16:49*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*116 %*	*48.9-115*		*03/04/21 16:49*	*EPA 8270D*	cdb	O
Surrogate: 2,4,6-Tribromophenol		*104 %*	*46-153*		*03/04/21 16:49*	*EPA 8270D*	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-1**

Date/Time Sampled: 02/24/21 10:33

Laboratory Sample ID: **1C02026-07 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*127 %*	*50.5-121*		*03/04/21 16:49*	*EPA 8270D*	cdb	O
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Benzene	0.0054		0.0024	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Toluene	0.0097		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Ethylbenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Xylenes (total)	<0.0119		0.0119	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Isopropylbenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Acetone	<0.0119		0.0119	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Bromodichloromethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Bromoform	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Bromomethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
2-Butanone	<0.0119		0.0119	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Carbon disulfide	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Carbon tetrachloride	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Chlorobenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Chloroethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Chloroform	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	

GAI Consultants-Homestead	Project:	AGC RSA		
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**	
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36	
Project Manager: Edward Sciulli	Number of Containers:	52		

Client Sample ID: B-8-1 **Date/Time Sampled:** 02/24/21 10:33

Laboratory Sample ID: 1C02026-07 (Solid/Grab)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Chloromethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	F
Dibromochloromethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0024		0.0024	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0024		0.0024	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
2-Hexanone	<0.0119		0.0119	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Methylene chloride	<0.0237		0.0237	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-1**

Date/Time Sampled: 02/24/21 10:33

Laboratory Sample ID: **1C02026-07 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
4-Methyl-2-pentanone	<0.0119		0.0119	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Styrene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Tetrachloroethene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Trichloroethene	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0059		0.0059	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Vinyl chloride	<0.0024		0.0024	mg/kg dry	03/04/21 16:39	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*104 %*	*70-130*		*03/04/21 16:39*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*107 %*	*70-130*		*03/04/21 16:39*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*102 %*	*70-130*		*03/04/21 16:39*	*EPA 8260B*	JMG	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-8-2** **Date/Time Sampled:** 02/24/21 10:50

Laboratory Sample ID: **1C02026-08 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	88.2		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0298		0.0298	mg/kg dry	03/08/21 19:14	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<2.00		2.00	mg/kg dry	03/08/21 19:15	EPA 6010B/2.0	seg	
Aluminum	15000		50.0	mg/kg dry	03/08/21 19:14	EPA 6010B/2.0	seg	T
Arsenic	<4.00		4.00	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Barium	138		5.00	mg/kg dry	03/08/21 19:14	EPA 6010B/2.0	seg	
Beryllium	<1.00		1.00	mg/kg dry	03/08/21 19:15	EPA 6010B/2.0	seg	
Calcium	164000		100	mg/kg dry	03/08/21 19:13	EPA 6010B/2.0	seg	T
Cadmium	<2.00		2.00	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Cobalt	5.55		5.00	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-2**

Date/Time Sampled: 02/24/21 10:50

Laboratory Sample ID: **1C02026-08 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	16.4		2.50	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Copper	17.3		5.00	mg/kg dry	03/08/21 19:15	EPA 6010B/2.0	seg	
Iron	14200		20.0	mg/kg dry	03/08/21 19:13	EPA 6010B/2.0	seg	T
Potassium	6120		100	mg/kg dry	03/08/21 19:13	EPA 6010B/2.0	seg	
Magnesium	57400		100	mg/kg dry	03/08/21 19:13	EPA 6010B/2.0	seg	T
Manganese	433		5.00	mg/kg dry	03/08/21 19:15	EPA 6010B/2.0	seg	
Sodium	702		500	mg/kg dry	03/08/21 19:13	EPA 6010B/2.0	seg	
Nickel	<25.0		25.0	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Lead	5.51		4.00	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Antimony	<5.00		5.00	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Selenium	<10.0		10.0	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-8-2 **Date/Time Sampled:** 02/24/21 10:50

Laboratory Sample ID: 1C02026-08 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<10.0		10.0	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Vanadium	31.9		10.0	mg/kg dry	03/08/21 19:15	EPA 6010B/2.0	seg	
Zinc	34.0		10.0	mg/kg dry	03/08/21 19:16	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	
PCB-1221	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	
PCB-1232	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	
PCB-1242	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	
PCB-1248	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	
PCB-1254	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	
PCB-1260	<0.011		0.011	mg/kg dry	03/09/21 03:44	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*102 %*	*38.1-152*		*03/09/21 03:44*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*152 %*	*21.7-147*		*03/09/21 03:44*	*EPA 8082A*	cdb	O
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Acenaphthylene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-2**

Date/Time Sampled: 02/24/21 10:50

Laboratory Sample ID: **1C02026-08 (Solid/Grab)**

Semivolatile Organic Compounds by EPA Extraction Method 3541

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Anthracene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Benzo (a) anthracene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Benzo (a) pyrene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Chrysene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Naphthalene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Fluoranthene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Fluorene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Phenanthrene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Pyrene	<0.370		0.370	mg/kg dry	03/04/21 17:16	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*106 %*	*50.9-136*		*03/04/21 17:16*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*106 %*	*51.9-130*		*03/04/21 17:16*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*105 %*	*42.5-120*		*03/04/21 17:16*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*108 %*	*48.9-115*		*03/04/21 17:16*	*EPA 8270D*	cdb	
Surrogate: 2,4,6-Tribromophenol		*112 %*	*46-153*		*03/04/21 17:16*	*EPA 8270D*	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-8-2** **Date/Time Sampled:** 02/24/21 10:50

Laboratory Sample ID: **1C02026-08 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*119 %*	*50.5-121*		*03/04/21 17:16*	*EPA 8270D*	cdb	
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Benzene	0.0209		0.0020	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Toluene	0.0109		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Ethylbenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Xylenes (total)	<0.0102		0.0102	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Isopropylbenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Acetone	0.0160		0.0102	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Bromodichloromethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Bromoform	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Bromomethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
2-Butanone	<0.0102		0.0102	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Carbon disulfide	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Carbon tetrachloride	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Chlorobenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Chloroethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Chloroform	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-8-2 **Date/Time Sampled:** 02/24/21 10:50

Laboratory Sample ID: 1C02026-08 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Chloromethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	F
Dibromochloromethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0020		0.0020	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0020		0.0020	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
2-Hexanone	<0.0102		0.0102	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Methylene chloride	<0.0204		0.0204	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	

GAI Consultants-Homestead		Project:	AGC RSA	
385 East Waterfront Dr.		Project Number:	[none]	**Reported:**
Homestead PA, 15120		Collector:	CLIENT	03/22/21 16:36
Project Manager:	Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-8-2** **Date/Time Sampled:** 02/24/21 10:50

Laboratory Sample ID: **1C02026-08 (Solid/Grab)**

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
4-Methyl-2-pentanone	<0.0102		0.0102	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Styrene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Tetrachloroethene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Trichloroethene	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0051		0.0051	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Vinyl chloride	<0.0020		0.0020	mg/kg dry	03/04/21 17:04	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*104 %*	*70-130*		*03/04/21 17:04*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*109 %*	*70-130*		*03/04/21 17:04*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*98 %*	*70-130*		*03/04/21 17:04*	*EPA 8260B*	JMG	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-9-1 **Date/Time Sampled:** 03/01/21 11:23

Laboratory Sample ID: 1C02026-09 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	84.7		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0299		0.0299	mg/kg dry	03/08/21 19:17	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<2.31		2.31	mg/kg dry	03/08/21 19:32	EPA 6010B/2.0	seg	
Aluminum	8670		57.8	mg/kg dry	03/08/21 19:31	EPA 6010B/2.0	seg	T
Arsenic	<4.63		4.63	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Barium	119		5.78	mg/kg dry	03/08/21 19:31	EPA 6010B/2.0	seg	
Beryllium	<1.16		1.16	mg/kg dry	03/08/21 19:32	EPA 6010B/2.0	seg	
Calcium	201000		116	mg/kg dry	03/08/21 19:30	EPA 6010B/2.0	seg	T
Cadmium	<2.31		2.31	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Cobalt	6.20		5.78	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: B-9-1

Date/Time Sampled: 03/01/21 11:23

Laboratory Sample ID: 1C02026-09 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	10.3		2.89	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Copper	19.1		5.78	mg/kg dry	03/08/21 19:32	EPA 6010B/2.0	seg	
Iron	14800		23.1	mg/kg dry	03/08/21 19:30	EPA 6010B/2.0	seg	T
Potassium	1870		116	mg/kg dry	03/08/21 19:30	EPA 6010B/2.0	seg	
Magnesium	36400		116	mg/kg dry	03/08/21 19:30	EPA 6010B/2.0	seg	T
Manganese	633		5.78	mg/kg dry	03/08/21 19:32	EPA 6010B/2.0	seg	
Sodium	<578		578	mg/kg dry	03/08/21 19:30	EPA 6010B/2.0	seg	
Nickel	<28.9		28.9	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Lead	5.84		4.63	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Antimony	<5.78		5.78	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Selenium	<11.6		11.6	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-9-1** **Date/Time Sampled:** 03/01/21 11:23

Laboratory Sample ID: **1C02026-09 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<11.6		11.6	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Vanadium	25.9		11.6	mg/kg dry	03/08/21 19:32	EPA 6010B/2.0	seg	
Zinc	31.8		11.6	mg/kg dry	03/08/21 19:33	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	
PCB-1221	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	
PCB-1232	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	
PCB-1242	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	
PCB-1248	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	
PCB-1254	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	
PCB-1260	<0.012		0.012	mg/kg dry	03/11/21 00:01	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*86.4 %*	*38.1-152*		*03/11/21 00:01*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*119 %*	*21.7-147*		*03/11/21 00:01*	*EPA 8082A*	cdb	
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Acenaphthylene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	

GAI Consultants-Homestead	Project:	AGC RSA		
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**	
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36	
Project Manager: Edward Sciulli	Number of Containers:	52		

Client Sample ID: **B-9-1** **Date/Time Sampled:** 03/01/21 11:23

Laboratory Sample ID: **1C02026-09 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Anthracene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Benzo (a) anthracene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Benzo (a) pyrene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Chrysene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Naphthalene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Fluoranthene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Fluorene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Phenanthrene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Pyrene	<0.384		0.384	mg/kg dry	03/20/21 04:02	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol	*195 %*		*50.9-136*		*03/20/21 04:02*	*EPA 8270D*	cdb	O
Surrogate: Phenol-d6	*190 %*		*51.9-130*		*03/20/21 04:02*	*EPA 8270D*	cdb	O
Surrogate: Nitrobenzene-d5	*196 %*		*42.5-120*		*03/20/21 04:02*	*EPA 8270D*	cdb	O
Surrogate: 2-Fluorobiphenyl	*200 %*		*48.9-115*		*03/20/21 04:02*	*EPA 8270D*	cdb	O
Surrogate: 2,4,6-Tribromophenol	*186 %*		*46-153*		*03/20/21 04:02*	*EPA 8270D*	cdb	O

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-1**

Date/Time Sampled: 03/01/21 11:23

Laboratory Sample ID: **1C02026-09 (Solid/Grab)**

Semivolatile Organic Compounds by EPA Extraction Method 3541

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Surrogate: Terphenyl-d14		*236 %*	*50.5-121*		*03/20/21 04:02*	*EPA 8270D*	cdb	O

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Benzene	0.0057		0.0021	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Toluene	0.0097		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Ethylbenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Xylenes (total)	<0.0105		0.0105	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Isopropylbenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Acetone	<0.0105		0.0105	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Bromodichloromethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Bromoform	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Bromomethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
2-Butanone	<0.0105		0.0105	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Carbon disulfide	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Carbon tetrachloride	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Chlorobenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Chloroethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Chloroform	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-1**

Date/Time Sampled: 03/01/21 11:23

Laboratory Sample ID: **1C02026-09 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Chloromethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	F
Dibromochloromethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0021		0.0021	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0021		0.0021	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
2-Hexanone	<0.0105		0.0105	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Methylene chloride	<0.0210		0.0210	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-1** **Date/Time Sampled:** 03/01/21 11:23

Laboratory Sample ID: **1C02026-09 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
4-Methyl-2-pentanone	<0.0105		0.0105	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Styrene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Tetrachloroethene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Trichloroethene	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0053		0.0053	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Vinyl chloride	<0.0021		0.0021	mg/kg dry	03/04/21 17:28	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*100 %*	*70-130*		*03/04/21 17:28*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*108 %*	*70-130*		*03/04/21 17:28*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*98 %*	*70-130*		*03/04/21 17:28*	*EPA 8260B*	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-2**

Date/Time Sampled: 03/01/21 11:39

Laboratory Sample ID: **1C02026-10 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Conventional Chemistry Parameters by SM/EPA Methods								
% Solids	87.8		0.100	%	03/03/21 11:00	SM 2540 G-11	EEV	
Metals by EPA 6000/7000 Series Methods								
Mercury	<0.0315		0.0315	mg/kg dry	03/08/21 19:19	EPA 7471B	cam	
Metals by Prep Method EPA 3050B								
Silver	<1.98		1.98	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Aluminum	14600		49.4	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	T
Arsenic	<3.95		3.95	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Barium	104		4.94	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	
Beryllium	<0.989		0.989	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Calcium	130000		98.9	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	T
Cadmium	<1.98		1.98	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Cobalt	7.92		4.94	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: B-9-2

Date/Time Sampled: 03/01/21 11:39

Laboratory Sample ID: 1C02026-10 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Chromium	16.5		2.47	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Copper	16.4		4.94	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Iron	13100		19.8	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	T
Potassium	5700		98.9	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	
Magnesium	44000		98.9	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	T
Manganese	364		4.94	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Sodium	587		494	mg/kg dry	03/08/21 19:37	EPA 6010B/2.0	seg	
Nickel	<24.7		24.7	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Lead	7.40		3.95	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Antimony	<4.94		4.94	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Selenium	<9.89		9.89	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: B-9-2 **Date/Time Sampled:** 03/01/21 11:39

Laboratory Sample ID: 1C02026-10 (Solid/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Metals by Prep Method EPA 3050B								
Thallium	<9.89		9.89	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Vanadium	25.9		9.89	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Zinc	43.2		9.89	mg/kg dry	03/08/21 19:39	EPA 6010B/2.0	seg	
Polychlorinated Biphenyls by EPA Extraction Method 3541								
PCB-1016	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	
PCB-1221	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	
PCB-1232	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	
PCB-1242	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	
PCB-1248	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	
PCB-1254	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	
PCB-1260	<0.011		0.011	mg/kg dry	03/11/21 01:32	EPA 8082A	cdb	D
Surrogate: Tetrachloro-meta-xylene		*66.3 %*	*38.1-152*		*03/11/21 01:32*	*EPA 8082A*	cdb	
Surrogate: Decachlorobiphenyl		*122 %*	*21.7-147*		*03/11/21 01:32*	*EPA 8082A*	cdb	
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Acenaphthene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Acenaphthylene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-2**

Date/Time Sampled: 03/01/21 11:39

Laboratory Sample ID: **1C02026-10 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Anthracene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Benzo (a) anthracene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Benzo (b) fluoranthene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Benzo (k) fluoranthene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Benzo (g,h,i) perylene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Benzo (a) pyrene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Chrysene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Dibenz (a,h) anthracene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Naphthalene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Fluoranthene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Fluorene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Indeno (1,2,3-cd) pyrene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Phenanthrene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Pyrene	<0.378		0.378	mg/kg dry	03/20/21 04:28	EPA 8270D	cdb	
Surrogate: 2-Fluorophenol		*98.9 %*	*50.9-136*		*03/20/21 04:28*	*EPA 8270D*	cdb	
Surrogate: Phenol-d6		*94.5 %*	*51.9-130*		*03/20/21 04:28*	*EPA 8270D*	cdb	
Surrogate: Nitrobenzene-d5		*94.6 %*	*42.5-120*		*03/20/21 04:28*	*EPA 8270D*	cdb	
Surrogate: 2-Fluorobiphenyl		*94.2 %*	*48.9-115*		*03/20/21 04:28*	*EPA 8270D*	cdb	
Surrogate: 2,4,6-Tribromophenol		*92.6 %*	*46-153*		*03/20/21 04:28*	*EPA 8270D*	cdb	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-2**

Date/Time Sampled: 03/01/21 11:39

Laboratory Sample ID: **1C02026-10 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Semivolatile Organic Compounds by EPA Extraction Method 3541								
Surrogate: Terphenyl-d14		*108 %*	*50.5-121*		*03/20/21 04:28*	*EPA 8270D*	cdb	
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Benzene	<0.0020		0.0020	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Toluene	0.0067		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Ethylbenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Xylenes (total)	<0.0098		0.0098	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Isopropylbenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Methyl tert-butyl ether	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Acetone	<0.0098		0.0098	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Bromodichloromethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Bromoform	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Bromomethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
2-Butanone	<0.0098		0.0098	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Carbon disulfide	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Carbon tetrachloride	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Chlorobenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Chloroethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Chloroform	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Client Sample ID: **B-9-2**

Date/Time Sampled: 03/01/21 11:39

Laboratory Sample ID: **1C02026-10 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
Chloromethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,2-Dibromo-3-chloropropane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	F
Dibromochloromethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,2-Dibromoethane (EDB)	<0.0020		0.0020	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,2-Dichlorobenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,4-Dichlorobenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,3-Dichlorobenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Dichlorodifluoromethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,2-Dichloroethane	<0.0020		0.0020	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,1-Dichloroethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
trans-1,2-Dichloroethene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
cis-1,2-Dichloroethene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,1-Dichloroethene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,2-Dichloropropane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
trans-1,3-Dichloropropene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
cis-1,3-Dichloropropene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
2-Hexanone	<0.0098		0.0098	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Methylene chloride	<0.0196		0.0196	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Client Sample ID: **B-9-2** **Date/Time Sampled:** 03/01/21 11:39

Laboratory Sample ID: **1C02026-10 (Solid/Grab)**

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Analytical Method	* Analyst	Note
Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035								
4-Methyl-2-pentanone	<0.0098		0.0098	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Styrene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,1,2,2-Tetrachloroethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Tetrachloroethene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,2,4-Trichlorobenzene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,1,1-Trichloroethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
1,1,2-Trichloroethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Trichloroethene	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Trichlorofluoromethane	<0.0049		0.0049	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Vinyl chloride	<0.0020		0.0020	mg/kg dry	03/04/21 17:53	EPA 8260B	JMG	
Surrogate: 4-Bromofluorobenzene		*100 %*	*70-130*		*03/04/21 17:53*	*EPA 8260B*	JMG	
Surrogate: 1,2-Dichloroethane-d4		*104 %*	*70-130*		*03/04/21 17:53*	*EPA 8260B*	JMG	
Surrogate: Fluorobenzene		*97 %*	*70-130*		*03/04/21 17:53*	*EPA 8260B*	JMG	

Quality Control

Conventional Chemistry Parameters by SM/EPA Methods

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1061055 - General Prep										
Blank (1061055-BLK1)					Prepared: 03/02/21 Analyzed: 03/03/21					
% Solids	ND		0.100	%						
Blank (1061055-BLK2)					Prepared: 03/02/21 Analyzed: 03/03/21					
% Solids	ND		0.100	%						
Batch: 1061056 - General Prep										
Blank (1061056-BLK1)					Prepared: 03/02/21 Analyzed: 03/03/21					
% Solids	ND		0.100	%						
Blank (1061056-BLK2)					Prepared: 03/02/21 Analyzed: 03/03/21					
% Solids	ND		0.100	%						
Batch: 1061057 - General Prep										
Blank (1061057-BLK1)					Prepared: 03/02/21 Analyzed: 03/03/21					
% Solids	ND		0.100	%						
Blank (1061057-BLK2)					Prepared: 03/02/21 Analyzed: 03/03/21					
% Solids	ND		0.100	%						

Quality Control

(Continued)

Metals by EPA 245.1

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1061108 - EPA 200 Series										
Blank (1061108-BLK1)				Prepared: 03/02/21 Analyzed: 03/03/21						
Mercury	ND		0.000200	mg/l						

Quality Control
(Continued)

Metals by EPA 6000/7000 Series Methods

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1067101 - EPA 7471A										
Blank (1067101-BLK1)					Prepared & Analyzed: 03/08/21					
Mercury	ND		0.0224	mg/kg wet						

Quality Control

(Continued)

Metals by Prep Method EPA 200.2

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1061105 - EPA 200.2										
Blank (1061105-BLK1)					Prepared: 03/02/21 Analyzed: 03/05/21					
Aluminum	ND		0.100	mg/l						
Antimony	ND		0.0100	mg/l						
Arsenic	ND		0.00800	mg/l						
Barium	ND		0.0200	mg/l						
Beryllium	ND		0.00200	mg/l						
Cadmium	ND		0.00400	mg/l						
Calcium	ND		0.500	mg/l						
Chromium	ND		0.00500	mg/l						
Cobalt	ND		0.0100	mg/l						
Copper	ND		0.0100	mg/l						
Iron	ND		0.200	mg/l						
Lead	ND		0.00800	mg/l						
Magnesium	ND		0.200	mg/l						
Nickel	ND		0.0500	mg/l						
Manganese	ND		0.0200	mg/l						
Silver	ND		0.00400	mg/l						
Sodium	ND		1.00	mg/l						
Thallium	ND		0.0200	mg/l						
Vanadium	ND		0.0200	mg/l						
Batch: 1067046 - EPA 200.2										
Blank (1067046-BLK1)					Prepared & Analyzed: 03/08/21					
Aluminum	ND		0.100	mg/l						
Antimony	ND		0.0100	mg/l						

Quality Control

(Continued)

Metals by Prep Method EPA 200.2 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1067046 - EPA 200.2 (Continued)										
Blank (1067046-BLK1)					Prepared & Analyzed: 03/08/21					
Arsenic	ND		0.00800	mg/l						
Barium	ND		0.0200	mg/l						
Beryllium	ND		0.00200	mg/l						
Cadmium	ND		0.00400	mg/l						
Calcium	ND		0.500	mg/l						
Chromium	ND		0.00500	mg/l						
Cobalt	ND		0.0100	mg/l						
Copper	ND		0.0100	mg/l						
Iron	ND		0.200	mg/l						
Lead	ND		0.00800	mg/l						
Magnesium	ND		0.200	mg/l						
Nickel	ND		0.0500	mg/l						
Manganese	ND		0.0200	mg/l						
Potassium	ND		0.400	mg/l						
Selenium	ND		0.0200	mg/l						
Silver	ND		0.00400	mg/l						
Sodium	ND		1.00	mg/l						
Thallium	ND		0.0200	mg/l						
Vanadium	ND		0.0200	mg/l						
Zinc	ND		0.0200	mg/l						

GAI Consultants-Homestead	Project:	AGC RSA	
385 East Waterfront Dr.	Project Number:	[none]	**Reported:**
Homestead PA, 15120	Collector:	CLIENT	03/22/21 16:36
Project Manager: Edward Sciulli	Number of Containers:	52	

Quality Control

(Continued)

Metals by Prep Method EPA 3050B

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1063165 - EPA 3050B										
Blank (1063165-BLK1)					Prepared: 03/04/21 Analyzed: 03/08/21					
Aluminum	ND		49.7	mg/kg wet						
Antimony	ND		4.97	mg/kg wet						
Arsenic	ND		3.98	mg/kg wet						
Barium	ND		4.97	mg/kg wet						
Beryllium	ND		0.994	mg/kg wet						
Cadmium	ND		1.99	mg/kg wet						
Calcium	ND		99.4	mg/kg wet						
Chromium	ND		2.49	mg/kg wet						
Cobalt	ND		4.97	mg/kg wet						
Copper	ND		4.97	mg/kg wet						
Iron	ND		19.9	mg/kg wet						
Lead	ND		3.98	mg/kg wet						
Magnesium	ND		99.4	mg/kg wet						
Nickel	ND		24.9	mg/kg wet						
Potassium	ND		99.4	mg/kg wet						
Manganese	ND		4.97	mg/kg wet						
Selenium	ND		9.94	mg/kg wet						
Silver	ND		1.99	mg/kg wet						
Sodium	ND		497	mg/kg wet						
Thallium	ND		9.94	mg/kg wet						
Vanadium	ND		9.94	mg/kg wet						
Zinc	ND		9.94	mg/kg wet						

Quality Control

(Continued)

Polychlorinated Biphenyls by EPA Extraction Method 3510C

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1068083 - EPA 3510C										
Blank (1068083-BLK1)					Prepared: 03/09/21 Analyzed: 03/10/21					
PCB-1016	ND		0.0100	ug/l						
PCB-1221	ND		0.0100	ug/l						
PCB-1232	ND		0.0100	ug/l						
PCB-1242	ND		0.0100	ug/l						
PCB-1248	ND		0.0100	ug/l						
PCB-1254	ND		0.0100	ug/l						
PCB-1260	ND		0.0100	ug/l						

GAI Consultants-Homestead
385 East Waterfront Dr.
Homestead PA, 15120
Project Manager: Edward Sciulli

Project: AGC RSA
Project Number: [none]
Collector: CLIENT
Number of Containers: 52

Reported:
03/22/21 16:36

Quality Control
(Continued)

Polychlorinated Biphenyls by EPA Extraction Method 3541

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1063108 - EPA 3541										
Blank (1063108-BLK1)					Prepared: 03/04/21 Analyzed: 03/08/21					
PCB-1016	ND		0.010	mg/kg wet						
PCB-1221	ND		0.010	mg/kg wet						
PCB-1232	ND		0.010	mg/kg wet						
PCB-1242	ND		0.010	mg/kg wet						
PCB-1248	ND		0.010	mg/kg wet						
PCB-1254	ND		0.010	mg/kg wet						
PCB-1260	ND		0.010	mg/kg wet						
Batch: 1067038 - EPA 3541										
Blank (1067038-BLK1)					Prepared: 03/08/21 Analyzed: 03/10/21					
PCB-1016	ND		0.010	mg/kg wet						
PCB-1221	ND		0.010	mg/kg wet						
PCB-1232	ND		0.010	mg/kg wet						
PCB-1242	ND		0.010	mg/kg wet						
PCB-1248	ND		0.010	mg/kg wet						
PCB-1254	ND		0.010	mg/kg wet						
PCB-1260	ND		0.010	mg/kg wet						

Quality Control

(Continued)

Semivolatile Organic Compounds by EPA Extraction Method 3510C

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1060041 - EPA 3510C										
Blank (1060041-BLK1)					Prepared: 03/01/21 Analyzed: 03/03/21					
Acenaphthene	ND		1.00	ug/l						
Acenaphthylene	ND		1.00	ug/l						
Anthracene	ND		1.00	ug/l						
Benzo (a) anthracene	ND		1.00	ug/l						
Benzo (b) fluoranthene	ND		1.00	ug/l						
Benzo (k) fluoranthene	ND		1.00	ug/l						
Benzo (g,h,i) perylene	ND		1.00	ug/l						
Benzo (a) pyrene	ND		1.00	ug/l						
Chrysene	ND		1.00	ug/l						
Dibenz (a,h) anthracene	ND		1.00	ug/l						
Naphthalene	ND		1.00	ug/l						
Fluoranthene	ND		1.00	ug/l						
Fluorene	ND		1.00	ug/l						
Indeno (1,2,3-cd) pyrene	ND		1.00	ug/l						
Phenanthrene	ND		1.00	ug/l						
Pyrene	ND		1.00	ug/l						

GAI Consultants-Homestead		Project:	AGC RSA	
385 East Waterfront Dr.		Project Number:	[none]	**Reported:**
Homestead PA, 15120		Collector:	CLIENT	03/22/21 16:36
Project Manager:	Edward Sciulli	Number of Containers:	52	

Quality Control

(Continued)

Semivolatile Organic Compounds by EPA Extraction Method 3541

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1062013 - EPA 3541										
Blank (1062013-BLK1)					Prepared: 03/02/21 Analyzed: 03/04/21					
Acenaphthene	ND		0.333	mg/kg wet						
Acenaphthylene	ND		0.333	mg/kg wet						
Anthracene	ND		0.333	mg/kg wet						
Benzo (a) anthracene	ND		0.333	mg/kg wet						
Benzo (b) fluoranthene	ND		0.333	mg/kg wet						
Benzo (k) fluoranthene	ND		0.333	mg/kg wet						
Benzo (g,h,i) perylene	ND		0.333	mg/kg wet						
Benzo (a) pyrene	ND		0.333	mg/kg wet						
Chrysene	ND		0.333	mg/kg wet						
Dibenz (a,h) anthracene	ND		0.333	mg/kg wet						
Naphthalene	ND		0.333	mg/kg wet						
Fluoranthene	ND		0.333	mg/kg wet						
Fluorene	ND		0.333	mg/kg wet						
Indeno (1,2,3-cd) pyrene	ND		0.333	mg/kg wet						
Phenanthrene	ND		0.333	mg/kg wet						
Pyrene	ND		0.333	mg/kg wet						
Batch: 1069083 - EPA 3541										
Blank (1069083-BLK1)					Prepared: 03/09/21 Analyzed: 03/10/21					
Acenaphthene	ND		0.333	mg/kg wet						
Acenaphthylene	ND		0.333	mg/kg wet						
Anthracene	ND		0.333	mg/kg wet						
Benzo (a) anthracene	ND		0.333	mg/kg wet						
Benzo (b) fluoranthene	ND		0.333	mg/kg wet						

Quality Control

(Continued)

Semivolatile Organic Compounds by EPA Extraction Method 3541 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1069083 - EPA 3541 (Continued)										
Blank (1069083-BLK1)					Prepared: 03/09/21 Analyzed: 03/10/21					
Benzo (k) fluoranthene	ND		0.333	mg/kg wet						
Benzo (g,h,i) perylene	ND		0.333	mg/kg wet						
Benzo (a) pyrene	ND		0.333	mg/kg wet						
Chrysene	ND		0.333	mg/kg wet						
Dibenz (a,h) anthracene	ND		0.333	mg/kg wet						
Naphthalene	ND		0.333	mg/kg wet						
Fluoranthene	ND		0.333	mg/kg wet						
Fluorene	ND		0.333	mg/kg wet						
Indeno (1,2,3-cd) pyrene	ND		0.333	mg/kg wet						
Phenanthrene	ND		0.333	mg/kg wet						
Pyrene	ND		0.333	mg/kg wet						

Quality Control

(Continued)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1063087 - Volatiles										
Blank (1063087-BLK1)					Prepared & Analyzed: 03/04/21					
Benzene	ND		0.0020	mg/kg wet						
Toluene	ND		0.0050	mg/kg wet						
Ethylbenzene	ND		0.0050	mg/kg wet						
Xylenes (total)	ND		0.0100	mg/kg wet						
Isopropylbenzene	ND		0.0050	mg/kg wet						
Methyl tert-butyl ether	ND		0.0050	mg/kg wet						
Acetone	ND		0.0100	mg/kg wet						
Bromodichloromethane	ND		0.0050	mg/kg wet						
Bromoform	ND		0.0050	mg/kg wet						
Bromomethane	ND		0.0050	mg/kg wet						
2-Butanone	ND		0.0100	mg/kg wet						
Carbon disulfide	ND		0.0050	mg/kg wet						
Carbon tetrachloride	ND		0.0050	mg/kg wet						
Chlorobenzene	ND		0.0050	mg/kg wet						
Chloroethane	ND		0.0050	mg/kg wet						
Chloroform	ND		0.0050	mg/kg wet						
Chloromethane	ND		0.0050	mg/kg wet						
1,2-Dibromo-3-chloropropane	ND		0.0050	mg/kg wet						
Dibromochloromethane	ND		0.0050	mg/kg wet						
1,2-Dibromoethane (EDB)	ND		0.0020	mg/kg wet						
1,2-Dichlorobenzene	ND		0.0050	mg/kg wet						
1,4-Dichlorobenzene	ND		0.0050	mg/kg wet						
1,3-Dichlorobenzene	ND		0.0050	mg/kg wet						
Dichlorodifluoromethane	ND		0.0050	mg/kg wet						
1,2-Dichloroethane	ND		0.0020	mg/kg wet						

Quality Control

(Continued)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1063087 - Volatiles (Continued)										
Blank (1063087-BLK1)					Prepared & Analyzed: 03/04/21					
1,1-Dichloroethane	ND		0.0050	mg/kg wet						
trans-1,2-Dichloroethene	ND		0.0050	mg/kg wet						
cis-1,2-Dichloroethene	ND		0.0050	mg/kg wet						
1,1-Dichloroethene	ND		0.0050	mg/kg wet						
1,2-Dichloropropane	ND		0.0050	mg/kg wet						
trans-1,3-Dichloropropene	ND		0.0050	mg/kg wet						
cis-1,3-Dichloropropene	ND		0.0050	mg/kg wet						
2-Hexanone	ND		0.0100	mg/kg wet						
Methylene chloride	ND		0.0200	mg/kg wet						
4-Methyl-2-pentanone	ND		0.0100	mg/kg wet						
Styrene	ND		0.0050	mg/kg wet						
1,1,2,2-Tetrachloroethane	ND		0.0050	mg/kg wet						
Tetrachloroethene	ND		0.0050	mg/kg wet						
1,2,4-Trichlorobenzene	ND		0.0050	mg/kg wet						
1,1,1-Trichloroethane	ND		0.0050	mg/kg wet						
1,1,2-Trichloroethane	ND		0.0050	mg/kg wet						
Trichloroethene	ND		0.0050	mg/kg wet						
Trichlorofluoromethane	ND		0.0050	mg/kg wet						
Vinyl chloride	ND		0.0020	mg/kg wet						
Batch: 1064028 - Volatiles										
Blank (1064028-BLK1)					Prepared & Analyzed: 03/05/21					
Benzene	ND		1.00	ug/l						
Toluene	ND		1.00	ug/l						

Quality Control
(Continued)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1064028 - Volatiles (Continued)										
Blank (1064028-BLK1)					Prepared & Analyzed: 03/05/21					
Ethylbenzene	ND		1.00	ug/l						
Xylenes (total)	ND		2.00	ug/l						
Isopropylbenzene	ND		1.00	ug/l						
Methyl tert-butyl ether	ND		1.00	ug/l						
Acetone	ND		10.0	ug/l						
Bromodichloromethane	ND		1.00	ug/l						
Bromoform	ND		1.00	ug/l						
Bromomethane	ND		1.00	ug/l						
2-Butanone	ND		10.0	ug/l						
Carbon disulfide	ND		1.00	ug/l						
Carbon tetrachloride	ND		1.00	ug/l						
Chlorobenzene	ND		1.00	ug/l						
Chloroethane	ND		1.00	ug/l						
Chloroform	ND		1.00	ug/l						
Chloromethane	ND		1.00	ug/l						
1,2-Dibromo-3-chloropropane	ND		5.00	ug/l						
Dibromochloromethane	ND		1.00	ug/l						
1,2-Dibromoethane (EDB)	ND		1.00	ug/l						
1,2-Dichlorobenzene	ND		1.00	ug/l						
1,4-Dichlorobenzene	ND		1.00	ug/l						
1,3-Dichlorobenzene	ND		1.00	ug/l						
Dichlorodifluoromethane	ND		1.00	ug/l						
1,2-Dichloroethane	ND		1.00	ug/l						
1,1-Dichloroethane	ND		1.00	ug/l						
trans-1,2-Dichloroethene	ND		1.00	ug/l						

Quality Control
(Continued)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5030B (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: 1064028 - Volatiles (Continued)										
Blank (1064028-BLK1)					Prepared & Analyzed: 03/05/21					
cis-1,2-Dichloroethene	ND		1.00	ug/l						
1,1-Dichloroethene	ND		1.00	ug/l						
1,2-Dichloropropane	ND		1.00	ug/l						
trans-1,3-Dichloropropene	ND		1.00	ug/l						
cis-1,3-Dichloropropene	ND		1.00	ug/l						
2-Hexanone	ND		10.0	ug/l						
Methylene chloride	ND		1.00	ug/l						
4-Methyl-2-pentanone	ND		10.0	ug/l						
Styrene	ND		1.00	ug/l						
1,1,2,2-Tetrachloroethane	ND		1.00	ug/l						
Tetrachloroethene	ND		1.00	ug/l						
1,2,4-Trichlorobenzene	ND		1.00	ug/l						
1,1,1-Trichloroethane	ND		1.00	ug/l						
1,1,2-Trichloroethane	ND		1.00	ug/l						
Trichloroethene	ND		1.00	ug/l						
Trichlorofluoromethane	ND		1.00	ug/l						
Vinyl chloride	ND		1.00	ug/l						
Batch: 1068029 - Volatiles										
Blank (1068029-BLK1)					Prepared & Analyzed: 03/09/21					
Benzene	ND		0.0020	mg/kg wet						
Toluene	ND		0.0050	mg/kg wet						
Ethylbenzene	ND		0.0050	mg/kg wet						
Xylenes (total)	ND		0.0100	mg/kg wet						

Quality Control

(Continued)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035 (Continued)

Batch: 1068029 - Volatiles (Continued)

Blank (1068029-BLK1) Prepared & Analyzed: 03/09/21

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Isopropylbenzene	ND		0.0050	mg/kg wet						
Methyl tert-butyl ether	ND		0.0050	mg/kg wet						
Acetone	ND		0.0100	mg/kg wet						
Bromodichloromethane	ND		0.0050	mg/kg wet						
Bromoform	ND		0.0050	mg/kg wet						
Bromomethane	ND		0.0050	mg/kg wet						
2-Butanone	ND		0.0100	mg/kg wet						
Carbon disulfide	ND		0.0050	mg/kg wet						
Carbon tetrachloride	ND		0.0050	mg/kg wet						
Chlorobenzene	ND		0.0050	mg/kg wet						
Chloroethane	ND		0.0050	mg/kg wet						
Chloroform	ND		0.0050	mg/kg wet						
Chloromethane	ND		0.0050	mg/kg wet						
1,2-Dibromo-3-chloropropane	ND		0.0050	mg/kg wet						
Dibromochloromethane	ND		0.0050	mg/kg wet						
1,2-Dibromoethane (EDB)	ND		0.0020	mg/kg wet						
1,2-Dichlorobenzene	ND		0.0050	mg/kg wet						
1,4-Dichlorobenzene	ND		0.0050	mg/kg wet						
1,3-Dichlorobenzene	ND		0.0050	mg/kg wet						
Dichlorodifluoromethane	ND		0.0050	mg/kg wet						
1,2-Dichloroethane	ND		0.0020	mg/kg wet						
1,1-Dichloroethane	ND		0.0050	mg/kg wet						
trans-1,2-Dichloroethene	ND		0.0050	mg/kg wet						
cis-1,2-Dichloroethene	ND		0.0050	mg/kg wet						
1,1-Dichloroethene	ND		0.0050	mg/kg wet						

Quality Control
(Continued)

Volatile Organic Compounds by EPA Method 8260B/Prep Method 5035 (Continued)

Batch: 1068029 - Volatiles (Continued)

Blank (1068029-BLK1) Prepared & Analyzed: 03/09/21

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2-Dichloropropane	ND		0.0050	mg/kg wet						
trans-1,3-Dichloropropene	ND		0.0050	mg/kg wet						
cis-1,3-Dichloropropene	ND		0.0050	mg/kg wet						
2-Hexanone	ND		0.0100	mg/kg wet						
Methylene chloride	ND		0.0200	mg/kg wet						
4-Methyl-2-pentanone	ND		0.0100	mg/kg wet						
Styrene	ND		0.0050	mg/kg wet						
1,1,2,2-Tetrachloroethane	ND		0.0050	mg/kg wet						
Tetrachloroethene	ND		0.0050	mg/kg wet						
1,2,4-Trichlorobenzene	ND		0.0050	mg/kg wet						
1,1,1-Trichloroethane	ND		0.0050	mg/kg wet						
1,1,2-Trichloroethane	ND		0.0050	mg/kg wet						
Trichloroethene	ND		0.0050	mg/kg wet						
Trichlorofluoromethane	ND		0.0050	mg/kg wet						
Vinyl chloride	ND		0.0020	mg/kg wet						

Notes

D	A Continuing Calibration Verification (CCV) analyzed with the analytical batch recovered above the acceptance range for the noted analyte.
F	The Laboratory Control Sample (LCS) analyzed with this preparation batch recovered above the acceptance range for the noted analyte.
I5	The vial provided contained preservative for 5 grams of sample; however, the vial was received with greater than 130% of this amount of sample.
O	The noted surrogate value was above the acceptance range.
P	The noted surrogate value was below the acceptance range.
Q	Sample was analyzed at a dilution. Reporting limits were adjusted accordingly.
T	Result was over the calibration range, but within the linear dynamic range of the instrument for the noted analyte.

GAI Consultants-Homestead		Project:	AGC RSA	
385 East Waterfront Dr.		Project Number:	[none]	**Reported:**
Homestead PA, 15120		Collector:	CLIENT	03/22/21 16:36
Project Manager:	Edward Sciulli	Number of Containers:	52	

Definitions:

	If surrogate values are not within the indicated range, then the results are considered to be estimated.
	Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.
+	MBAS, calculated as LAS, mol wt 348
	If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.
	Unless otherwise noted, all results for solids are reported on a dry weight basis.
	Samples collected by Fairway Laboratories' personnel are done so in accordance with Standard Operating Procedures established by Fairway Laboratories.
#	The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen, filtration for ortho phosphorus, and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory; and should be considered as analyzed outside the EPA holding time.
^	The following analytes are to be filtered immediately upon sampling: Hexavalent Chromium. Filtration through a 0.45 micron filter within 15 minutes of sampling is required for compliance with the Clean Water Act (CWA) for reporting of hexavalent chromium to prevent interconversion of chromium species.
*	**Analysis location indicator:** **D**: Indicates analysis performed by Fairway Laboratories, Inc., 110 McCracken Run Rd., DuBois, PA 15801. PA DEP Chapter 252 certification: PA 33-00258. **E**: Indicates analysis performed by Fairway Laboratories, Inc., 1920 East 38th Street, Erie, PA 16510. NELAP certification: PA 25-05907. **G**: Indicates analysis performed by Fairway Laboratories, Inc., 4727 Route 30 Ste 204, Greensburg, PA 15601. PA DEP Chapter 252 certification: PA 65-00392. **P**: Indicates analysis performed by Fairway Laboratories, Inc., 89 Kristi Rd., Pennsdale, PA 17756. PA DEP Chapter 252 certification: PA 41-04684. **W**: Indicates analysis performed by Fairway Laboratories, Inc., 1980 Golden Mile Rd., Wysox, PA 18854. NELAP certification: PA 08-05622 and NY 12127.
<	Represents "less than" - indicates that the result was less than the RL, or the MDL if indicated for the parameter.
MDL	Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the RL are considered estimated values. If Radiological results are reported, the MDC - Minimum Detectable Concentration is shown in the MDL column.
RL	Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.
[CALC]	Indicates a calculated result. Calculations use results from other analyses performed under accredited methods.

Terms & Conditions

Services provided by Fairway Laboratories Inc. are limited to the terms and conditions stated herein, unless otherwise agreed to in a formal contract.

CHAIN OF CUSTODY Fairway Laboratories Inc. (“Fairway,” “us” or “we”) will initiate a chain-of-custody/request for analysis upon sample receipt unless the client includes a completed form with the received sample(s). Upon request, Fairway will provide chain-of-custody forms for use.

CONFIDENTIALITY Fairway maintains confidentiality in all of our client interactions. The client’s consent will be required before releasing information about the services provided.

CONTRACTS All contracts are subject to review and approval by Fairway’s legal council. Each contract must be signed by a corporate officer.

PAYMENT/BILLING Unless otherwise set forth in a signed contract or purchase order, terms of payment are “NET 30 Days.” The time allowed for payment shall begin based on the invoice date. A 1.5% per month service charge may be added to all unpaid balances beyond the initial 30 days. In its sole discretion, Fairway reserves the right to request payment before services and hold sample results for payment of due balances. We will not bill a third party without prior agreement among all parties acknowledging and accepting responsibility for payment.

SAMPLE COLLECTION AND SUBMISSION Clients not requesting collection services from Fairway are responsible for proper collection, preservation, packaging, and delivery of samples to the laboratory in accordance with current law and commercial practice. Fairway shall have no responsibility for sample integrity prior to the receipt of the sample(s) and/or for any inaccuracy in test or analyses results as a result of the failure of the client or any third party to maintain the integrity of samples prior to delivery to Fairway. All samples submitted must be accompanied by a completed chain of custody or similar document clearly noting the requested analyses, dates/time sampled, client contact information, and trail of custody. Samples received at the laboratory after business hours are verified on the next business day. Discrepancies are documented on the Receiving Document.

SUBCONTRACTING Some analyses may require subcontracting to another laboratory. Unless the client indicates otherwise, this decision will be made by Fairway. Subcontracted work will be identified on the final report in accordance with NELAC requirements.

RETURN OF RESULTS Fairway routinely provides faxed or verbal results within 10 working days of receipt of sample(s) and a hard copy of the data results is routinely received via US Postal Service within 15 working days. At the request of the client, Fairway may offer expedited return of sample results. Surcharges may apply to rush requests. All rush requests must be pre-approved by Fairway. We reserve the right to charge an archive retrieval fee for results older than one (1) year from the date of the request. All records will be maintained by Fairway for 5 years, after which, they will be destroyed.

SAMPLE DISPOSAL Fairway will maintain samples for four (4) weeks after the sample receipt date. Fairway will dispose of samples which are not and/or do not contain hazardous wastes (as such term is defined by applicable federal or state law), unless prior arrangements have been made for long-term storage. Fairway reserves the right to charge a disposal fee for the proper disposal of samples found or suspected to contain hazardous waste. A return shipping charge will be invoiced for samples returned to the client at their request.

HAZARD COMMUNICATION The client has the responsibility to inform the laboratory of any hazardous characteristics known or suspected about the sample, and to provide information on hazard prevention and personal protection as necessary or otherwise required by applicable law.

WARRANTY AND LIMITATION OF LIABILITY For services rendered, Fairway warrants that it will apply its best scientific knowledge and judgment and to employ its best level of effort consistent with professional standards within the environmental testing industry in performing the analytical services requested by its clients. We disclaim any other warranties, expressed or implied by law. Fairway does not accept any legal responsibility for the purposes for which client uses the test results.

LITIGATION All costs associated with compliance to any subpoena for documents, for testimony in a court of law, or for any other purpose relating to work performed by Fairway Laboratories, Inc. shall be invoiced by Fairway and paid by client. These costs shall include, but are not limited to, hourly charges for the persons involved,

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Please print. See back of COC for instructions/terms and conditions.

FAIRWAY LABORATORIES *Environmental Laboratory*

2019 9th Ave.
P.O. Box 1925
Altoona, PA 16602
Phone: (814) 946-4306
Fax: (814) 946-8791

Client Page # _____ of _____

Client Name: GAI CONSULTANTS
Address: 385 E. WATERFRONT Dr
HOMESTEAD PA 15120
Contact: ED Sciulli
Phone #: 412-399-5046
Fax #:
Project Name: AGC RSA
Quote/PO #:

TAT: Normal ☒ Rush ☐
Rush TAT subject to pre-approval and surcharge.
Date Required: ___/___/___

Received on ice? Y N
Sample Temp: ______

Reportable to PADEP? Yes ☐
PWSID #______

LAB USE ONLY
Work Order # 1C02026
Attach # 1
FLI Page # 1 of 2
Tracking #

	Sample Description/Location	GRAB	Composite	Composite Start: Start Date	Composite Start: Start Time	GRAB -or- Composite End: End Date	GRAB -or- Composite End: End Time	Matrix: Solid	Matrix: Water	Matrix: Other	# of Containers	TCL VOLATILES	TAL METALS	PAH	PCB				Bottle Type/Comments	
1	B-4-1					2/24/21	14:27	X			5	X	X	X	X					0
2	B-4-2					2/24/21	14:40	X			5	X	X	X	X					0
3	B-4-3					3/1/21	14:02		X		6	X	X	X	X					1.3
4	B-5-1					3/1/21	14:55		X		6	X	X	X	X					4.4
5	B-7-1					2/24/21	11:03	X			5	X	X	X	X					0
6	B-7-2					2/24/21	11:20	X			5	X	X	X	X					3.4
7	B-8-1					2/24/21	10:33	X			5	X	X	X	X					3.4
8	B-8-2					2/24/21	10:50	X			5	X	X	X	X					1.6
9	B-9-1					3/1/21	11:23	X			5	X	X	X	X					6
10	B-9-2					3/1/21	11:39	X			5	X	X	X	X					0

Military or AM/PM required

	Date	Time		Date	Time
Sampled by: (Signature)			Received by:		
Relinquished by: TREVOR DUJAIC	3/1/21	16:24	Received by:	3/1/21	16:24
Relinquished by:			Received by:		
Relinquished by:			Received by:	3/1/21	17:20

Remarks

By relinquishing my sample to Fairway Laboratories, Inc., I hereby agree to the terms and conditions printed on the reverse. White Original - FLI File Canary - FLI Copy Pink - Customer Receipt Copy

SOP FLI0601-002 Attachment G Revision 26 Date: May 22, 2019 Page of #2

Chain of Custody Receiving Document

Page 2 of 2

Receiver: VC

Date/Time of this check: 3/2/21 6:12 Client: GAI Cons. Lab # 1C02026

Received on ICE? Y ☐ * **Sample Temperature when delivered to the Lab:** 4.4 °C **Acceptable?** Y ☐ * **or In cool down process?** ☐ *

(Not applicable for WV compliance)

Custody Seals? N Intact? NA

Morning Temperature Verification <6°C (if applicable): ☑

COC/Labels on bottles agree? Y ☐* Correct containers for all the analysis requested? Y ☐ * Matrix: Solid / Water

COC #	Number and Type of BOTTLES										Comments
	Poly Non-Pres.	Poly H2SO4	Poly HNO3	Amber H2SO4	Amber Non-Pres.	Poly NaOH	VOCS (Head space?)	Other ☐ *	Properly Preserved ☐ *	Bacti	☐ * Internal notification completed for deviations.
1							1-MeOH 2-Sodbis	2 4oz jars	N/A	▨	
2							↓	↓		▨	
3	250		1		2		2HCl		Y	▨	
4	250		1		2		2HCl		Y	▨	
5							1-MeOH 2 Sodbis	2-4oz jars	N/A	▨	
6										▨	
7										▨	
8										▨	
9										▨	
10							↓	↓		▨	

*** DEVIATION PRESENT:**
- ☹ **No Ice** ( )
- ☹ **Not at Proper Temperature** ( )
- ☹ **Wrong Container** ( )
- ☹ **Missing Information:** ( )

CLIENT CALLED:
YES ( )
By Whom:
______ **Date:** ______

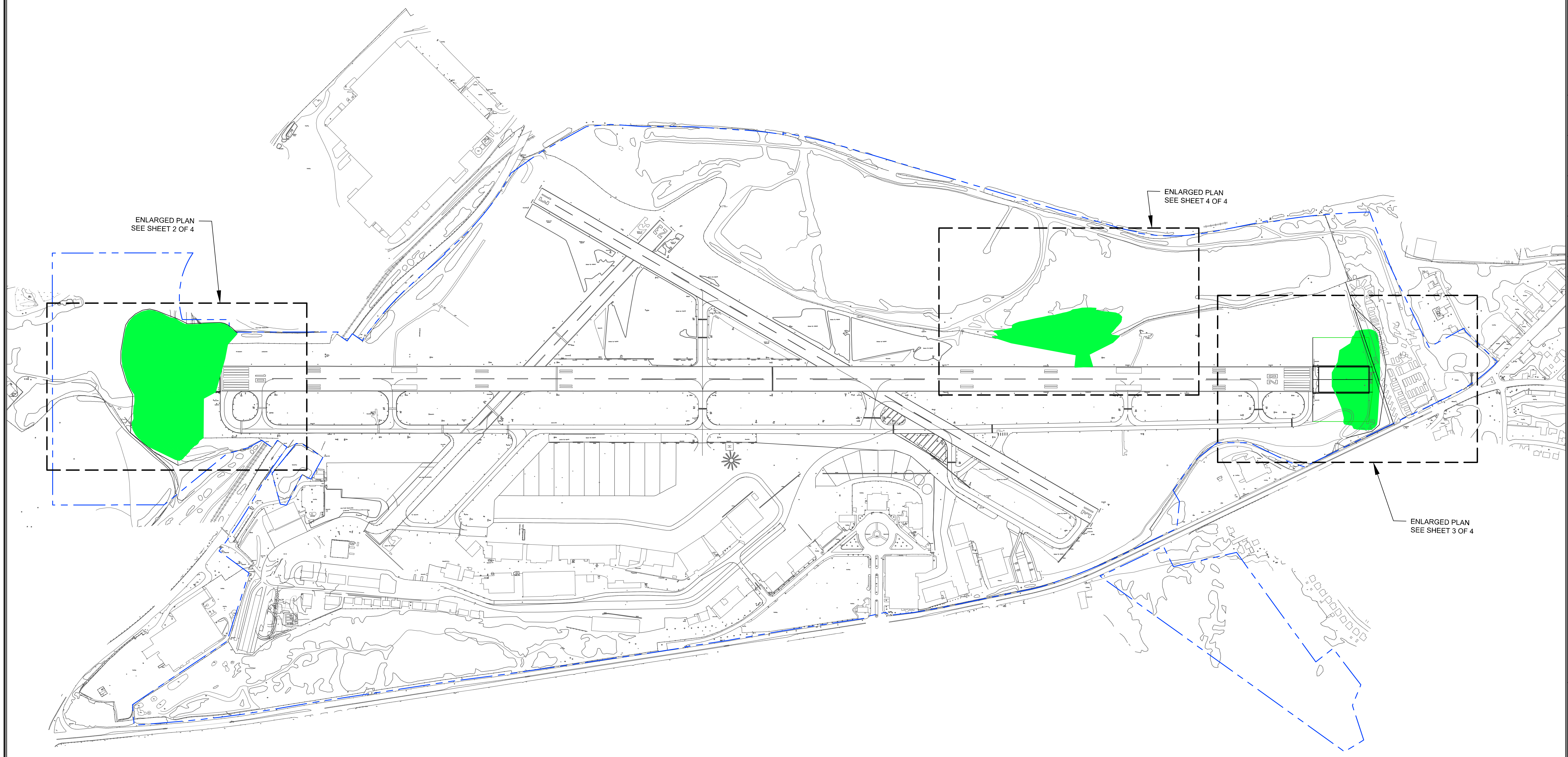
CLIENT RESPONSE:
- **Proceed with analysis; qualify data** ( )
- **Will Resample** ( )
- **Provided Information** ( )
- **No Response; Proceed and qualified** ( )

Client Contact: ______ **Date:** ______

* Comments: ______

This is a date sensitive document and may not be current February 26, 2021

E-2: Engineering Design Analysis Drawings

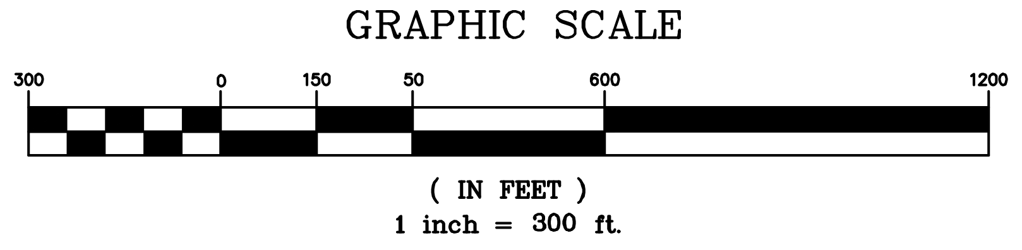


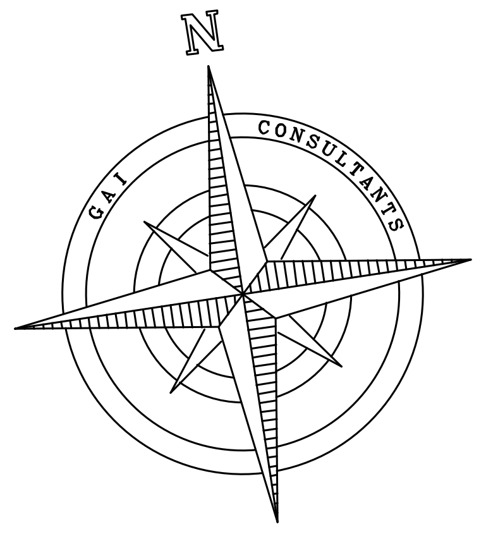
LEGEND

🟩	FILL VOLUME AREA
— · —	AIRPORT PROPERTY
— — —	EXISTING RUNWAY SAFETY AREA
▬ ▬ ▬	RUNWAY SAFETY AREA

NOTES:

1. BASE MAPPING AND PROPERTY LINES DEPICTED ARE BASED ON CAD DRAWINGS PROVIDED BY MCFARLAND JOHNSON.





REVISION RECORD

NO.:	DATE:	DWN:	CHK:	APV:	DESCRIPTION:

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DRAWING TITLE
OVERALL SITE PLAN

gai consultants

CLIENT
ALLEGHENY COUNTY
AIRPORT

PROJECT
RUNWAY SAFETY AREA
IMPROVEMENT
ALLEGANY COUNTY
AIRPORT AUTHORITY

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

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DRAWN BY:	CHECKED BY:	APPROVED BY:
WOODCA	**WOLFEBR**	**WOLFEBR**
DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	**12/2/2020**

SHEET NO.:
1 OF 4

REVISION
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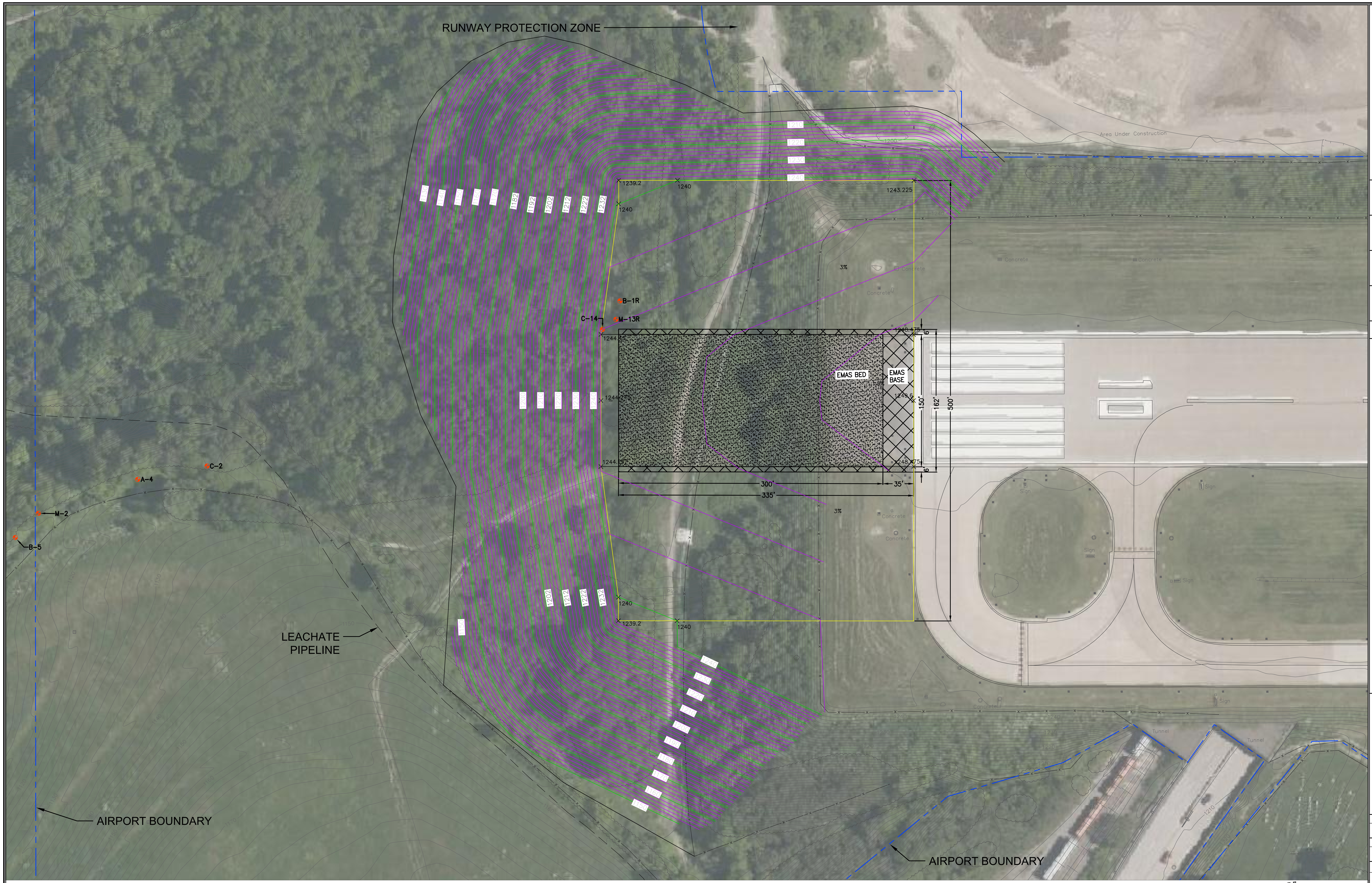

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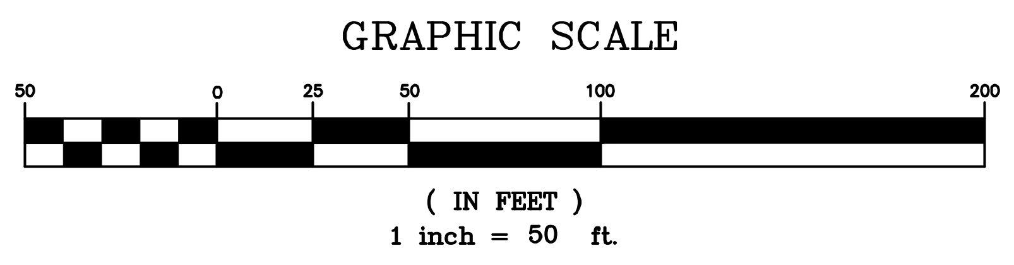

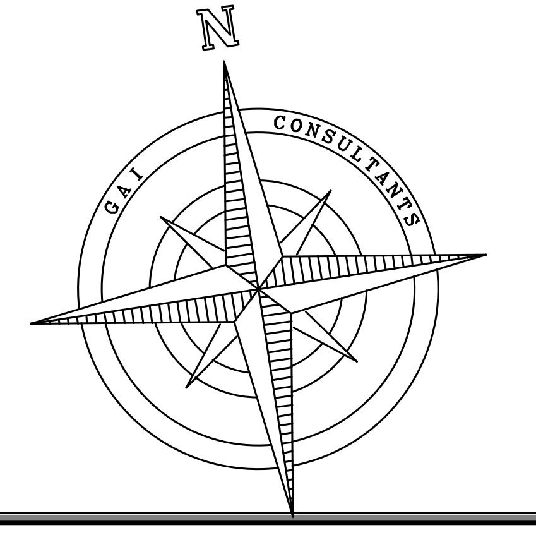

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DRAWING TITLE

RUNWAY 10 - 2 TO 1 SITE PLAN

PROJECT

**RUNWAY SAFETY AREA
IMPROVEMENT
ALLEGANY COUNTY
AIRPORT AUTHORITY**

gai consultants

CLIENT

**ALLEGHENY COUNTY
AIRPORT**

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

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WOODCA	**WOLFEBR**	**WOLFEBR**
DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	**12/2/2020**

SHEET NO.: **2 OF 4**

REVISION △

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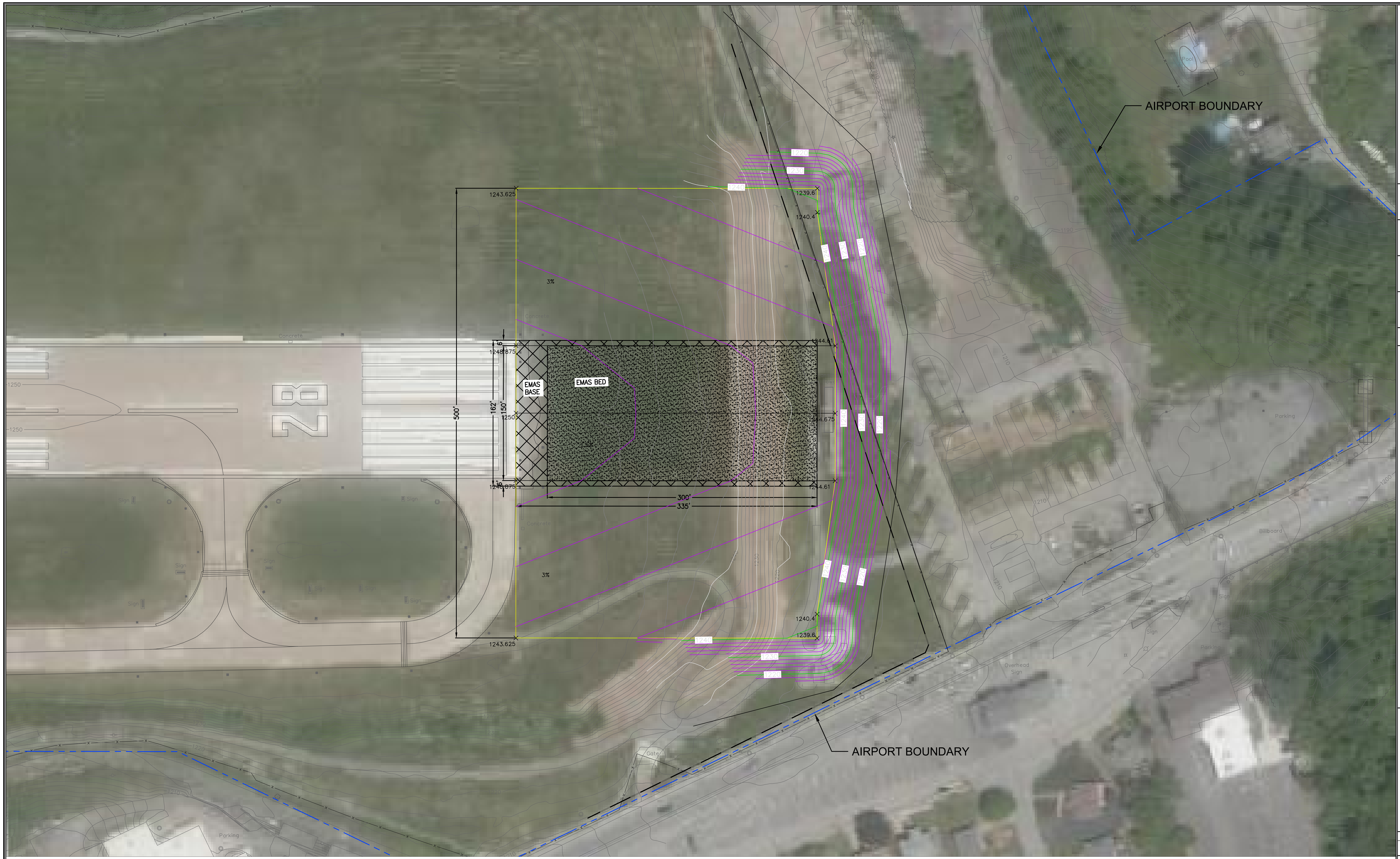

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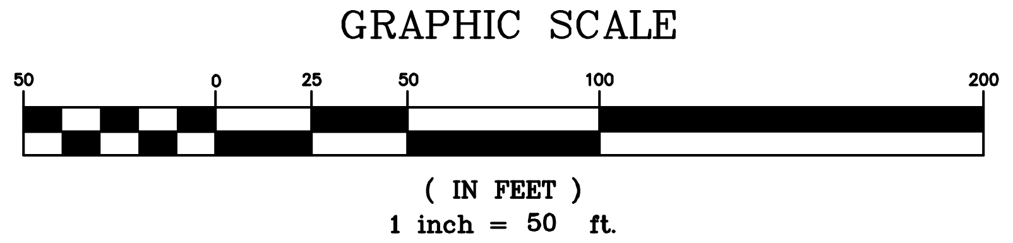

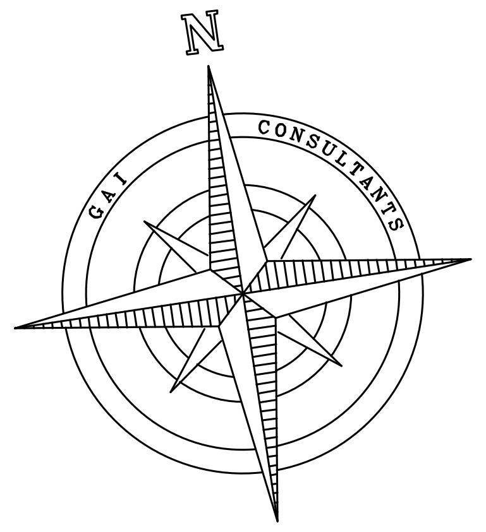

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DRAWING TITLE

RUNWAY 28 - 2 TO 1 SITE PLAN

PROJECT

RUNWAY SAFETY AREA IMPROVEMENT
ALLEGANY COUNTY AIRPORT AUTHORITY

CLIENT

ALLEGHENY COUNTY AIRPORT

gai consultants

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

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WOODCA	WOLFEBR	WOLFEBR
DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	12/2/2020
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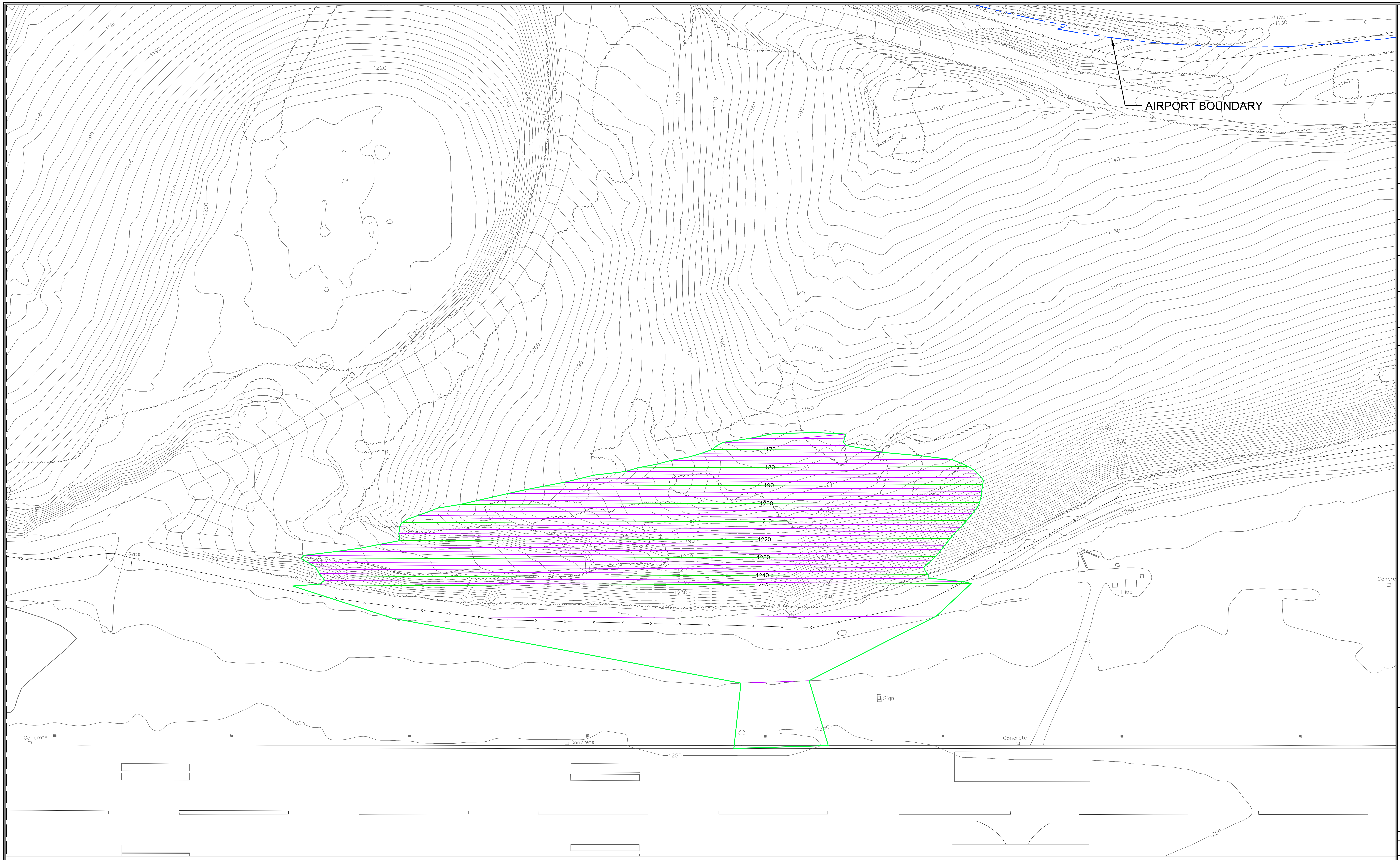
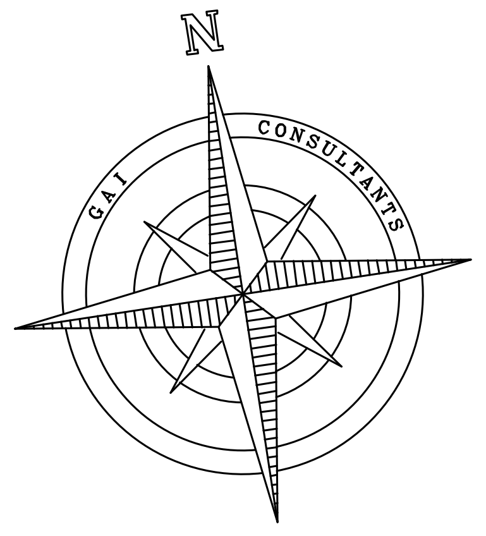


NOTES:

1. BASE MAPPING AND PROPERTY LINES DEPICTED ARE BASED ON CAD DRAWINGS PROVIDED BY MCFARLAND JOHNSON.

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.



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REVISION RECORD

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DRAWING TITLE
RUNWAY 28 - 2 TO 1 SITE PLAN

CLIENT
**ALLEGHENY COUNTY
AIRPORT**

gai consultants

PROJECT
**RUNWAY SAFETY AREA
IMPROVEMENT
ALLEGANY COUNTY
AIRPORT AUTHORITY**

ISSUING OFFICE: DuBois | 203 W. Weber Avenue, DuBois, PA 15801

DRAWN BY:	CHECKED BY:	APPROVED BY:
WOODCA	WOLFEBR	WOLFEBR
DWG TYPE:	SCALE:	ISSUE DATE:
	AS SHOWN	12/2/2020

SHEET NO.:
4 OF 4

REVISION
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GAI FILE NUMBER:
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GAI DRAWING NUMBER:

Appendix F

Cultural Resources:

F-1: PA SHPO Coordination Response
F-2: PA SHPO Project Submission Materials
F-3: ACAA SHPO Early Coordination Letter

F-1: PA SHPO Coordination Response

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

October 5, 2021

William Caramana
GAI Consultants, Inc.
385 E. Waterfront Drive
Homestead PA 151205005

RE: ER Project # 2021PR06386.001, Improvement of the Runway 10-28 Runway Safety Area, Federal Aviation Administration, West Mifflin Borough, Allegheny County

Dear William Caramana:

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
No Above Ground Concerns - Environmental Review - No Effect - Historic Properties Present - Above Ground

Thank you for submitting information concerning the above-referenced project. The following historic properties, listed in or eligible for the National Register of Historic Places, are located in the project area of potential effect: Allegheny County Airport, Resource # 2021RE00881. Based on the information received and available in our files, in our opinion, the proposed project will have no effect on these resources. Should the scope and/or nature of the project activities change and/or should you be made aware of historic property concerns, you will need to notify the PA SHPO at pashare@pa.gov and provide the revised designs for review and comment.

For questions concerning above ground resources, please contact Cheryl Nagle at chnagle@pa.gov.

Archaeological Resources
No Archaeological Concerns - Environmental Review - No Effect - Archaeological

Thank you for submitting information concerning the above-referenced project. Based on the information received and available in our files, in our opinion, the activity described in your proposal should have no effect on archaeological resources. Our analysis indicates that archaeological resources are potentially located in this project area. Should the scope of the project be amended to include additional ground disturbing activity and/or should you be made aware of historic property concerns, you will need to notify the PA SHPO at pashare@pa.gov. A Phase I Archaeological Survey may be necessary to locate all potentially significant archaeological resources.

For questions concerning archaeological resources, please contact Sara-Ladd Clark at saralclark@pa.gov.

Sincerely,

Andrea MacDonald

Andrea MacDonald
Director, State Historic Preservation Office

F-2: PA SHPO Project Submission Materials

PA-SHARE
PA's State Historic & Archaeological Resource Exchange

Pennsylvania Environmental Review Submission
Submission: VIQGD4Y7TBC9

Report Created: 10/04/2021

Contact Information

Email	First Name	Last Name
Organization		**Phone**
w.caramana@gaiconsultants.com	William	Caramana
GAI Consultants, Inc.		-

Project Overview

Project Name

Improvement of the Runway 10-28 Runway Safety Area

Project Description

The Allegheny County Airport Authority (ACAA), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for proposed improvements to the Runway 10-28 Runway Safety Area (RSA). The EA is being prepared in accordance with the National Environmental Policy Act of 1969, Council of Environmental Quality regulations, and FAA policy. It is anticipated the Draft EA will be completed in late 2021 for agency and public review. After consideration of comments, the FAA will make its decision to either prepare an Environmental Impact Statement or issue a Finding of No Significant Impact.

Present Land Use

The Proposed Undertaking would improve the Runway 10-28 RSA to meet safety requirements as established by the FAA for runways serving the types of aircraft that typically access the airport. The Proposed Undertaking would place fill material (clean dirt or stone) in three distinct areas on airport property in the Runway 10-28 RSA, including mid-runway and at both ends of the runway. This fill would correct the nonstandard slope in all three areas and would correct the width in the mid-runway location and for approximately 335 feet at each runway end. An Engineered Material Arresting System (EMAS), designed to compensate fully for the remaining RSA length deficits, would also be installed at both ends of the runway. An EMAS uses crushable, lightweight material placed at the end of a runway to stop an aircraft that overruns the runway. Other related improvements include re-routing service roads and relocating airport and utility infrastructure that would be impacted by the fill and establishing stormwater management features to support the new areas as necessary.

Previous Land Use

The airport is generally situated among residential, commercial, and industrial land uses and was built on top of a hill with steep slopes abutting the existing RSAs.

Involves Ground Disturbance

Yes

One or More Above Ground Resources 45 Years in Age or Older

No

Approximate Age of Buildings

0.0 Year(s)

Project Includes

Construction	Demolition	Rehabilitation	Disposition
Yes	No	No	No

Project Location

This project is located on:

Federal Property	State Property	Municipal Property	Private Property
No	No	Yes	No

Project Address

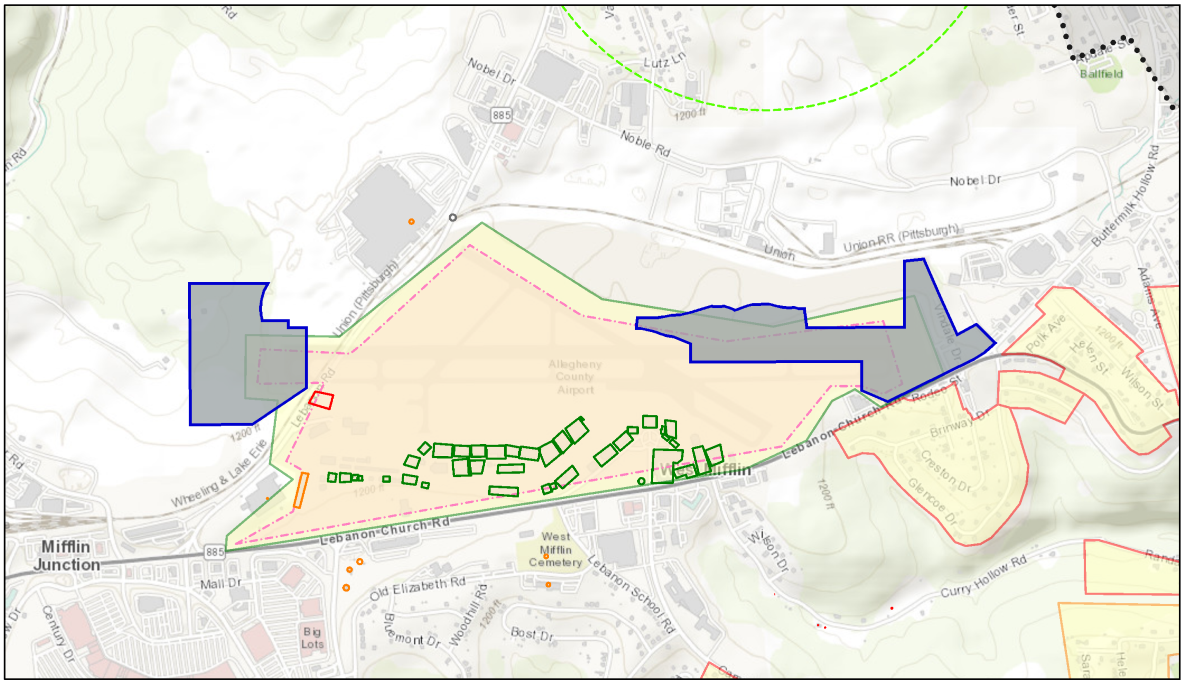
12 Allegheny County Airport

Project City	State	Project Zip
West Mifflin	PA	15122

APE Description	APE Area (acres)
Direct impacts of the Proposed Project would be limited to the fill areas and directly adjacent as the dirt airport service roads would be placed at specified areas on the edge of the new fill. The impacts associated with this Proposed Undertaking are anticipated to be less than but fully contained within the Proposed Project Area; therefore, we recommend that the Area of Potential Effect (APE) coincide with this boundary. The	83.33

Proposed Project Area at the Runway 10 end is approximately 36 acres and at the Runway 28 end/mid-runway area it is approximately 48 acres.

LOD Description	LOD Area (acres)
Direct impacts of the Proposed Project would be limited to the fill areas and directly adjacent as the dirt airport service roads would be placed at specified areas on the edge of the new fill. The impacts associated with this Proposed Undertaking are anticipated to be less than but fully contained within the Proposed Project Area; therefore, we recommend that the Area of Potential Effect (APE) coincide with this boundary. The Proposed Project Area at the Runway 10 end is approximately 36 acres and at the Runway 28 end/mid-runway area it is approximately 48 acres.	83.33



October 4, 2021

1:18,056
0 0.15 0.3 0.6 mi
0 0.25 0.5 1 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Municipalities Containing the Area of Potential Effect (APE)

Municipality	County
West Mifflin	Allegheny

Resource within the Project Area

Previously-Identified Above Ground & District Resources in the Area of Potential Effect (APE)

Resource Number	Resource Type	Resource Name	
Address			Eligibility
No Data			

Newly-Identified Resources and Previously-Identified Resources with Updated Information

Resource Type	Resource Subtype	Resource Name	
Address			Status
No Data			

Project Documents

Photos

No Photograph Available

Attachments

Attachment Type	Attachment Name	Date Created Name
Description		
Narrative	Notice of Preparation of an Environmental Assessment, For the Improvement of the Runway 10-28 Runway Safety Area, Allegheny County Airport (AGC), Pennsylvania	2021-10-04T20:00:16
Project narrative and attachments.		

F-3: ACAA SHPO Early Coordination Letter

ALLEGHENY COUNTY AIRPORT AUTHORITY
PITTSBURGH INTERNATIONAL AIRPORT
ALLEGHENY COUNTY AIRPORT

October 1, 2021

Andrea MacDonald, Bureau Director/Deputy State Historic Preservation Officer
Commonwealth Keystone Building
400 North Street
Harrisburg, Pennsylvania 17120

**RE: Notice of Preparation of an Environmental Assessment
For the Improvement of the Runway 10-28 Runway Safety Area
Allegheny County Airport (AGC), Pennsylvania**

Dear Ms. MacDonald:

The Allegheny County Airport Authority (ACAA), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for proposed improvements to the Runway 10-28 Runway Safety Area (RSA). The EA is being prepared in accordance with the *National Environmental Policy Act* of 1969, Council of Environmental Quality regulations, and FAA policy. It is anticipated the Draft EA will be completed in late 2021 for agency and public review. After consideration of comments, the FAA will make its decision to either prepare an Environmental Impact Statement or issue a Finding of No Significant Impact.

On behalf of the FAA, we are sending you this letter to:

1) inform you of the preparation of the EA,
2) consult on the additional analysis, if any, required by the SHPO for areas that would be impacted by the Proposed Project, and
3) to obtain an understanding of any interest, issues, concerns your agency may have regarding the Proposed Project.

Proposed Project Location

The airport is located in West Mifflin, Allegheny County approximately nine miles from Pittsburg, Pennsylvania (**Enclosure 1**). The airport is bordered by Lebanon Road (State Highway 885) and Union Railroad line to the west and Lebanon Church Road (State Highway 148) to the south and east. The airport boundary at the Runway 10 end is also adjacent to the Southern Taylor Landfill and Treatment Plant. The airport is generally situated among residential, commercial, and industrial land uses and was built on top of a hill with steep slopes abutting the existing RSAs.

Background

A Runway Safety Area is a rectangular area surrounding a runway that is designed to enhance the safety of aircraft that undershoot, overrun, or otherwise leave the paved runway surface. An airport must keep the RSA cleared, graded, drained, and accessible by firefighting and rescue equipment. RSA standards and dimensions are defined by the FAA based on the type of aircraft using the airport. In the case of AGC, a standard RSA would be 500 feet on either side of the runway, extend 1,000 feet beyond the end of the runway, and have no more than 3 percent slope for 200 feet off the runway end and a maximum 5 percent thereafter. In situations where land is not available or if existing obstacles make a standard RSA impossible, the FAA works with the airport to find alternative solutions. FAA regularly re-evaluates standard and non-standard RSAs and requires incremental improvements as applicable.

Description of the Proposed Undertaking and Area of Potential Effect

The Proposed Undertaking would improve the Runway 10-28 RSA to meet safety requirements as established by the FAA for runways serving the types of aircraft that typically access the airport. The Proposed Undertaking would place fill material (clean dirt or stone) in three distinct areas on airport property in the Runway 10-28 RSA, including mid-runway and at both ends of the runway. This fill would correct the nonstandard slope in all three areas and would correct the width in the mid-runway location and for approximately 335 feet at each runway end. An Engineered Material Arresting System (EMAS), designed to compensate fully for the remaining RSA length deficits, would also be installed at both ends of the runway. An EMAS uses crushable, lightweight material placed at the end of a runway to stop an aircraft that overruns the runway. Other related improvements include re-routing service roads and relocating airport and utility infrastructure that would be impacted by the fill and establishing stormwater management features to support the new areas as necessary. The Proposed Undertaking is depicted on **Enclosure 2**.

Direct impacts of the Proposed Project would be limited to the fill areas and directly adjacent as the dirt airport service roads would be placed at specified areas on the edge of the new fill. The impacts associated with this Proposed Undertaking are anticipated to be less than but fully contained within the Proposed Project Area; therefore, we recommend that the Area of Potential Effect (APE) coincide with this boundary. The Proposed Project Area at the Runway 10 end is approximately 36 acres and at the Runway 28 end/mid-runway area it is approximately 48 acres.

Need for the Proposed Undertaking

A standard RSA for Runway 10-28 at AGC is not feasible. The Runway 10-28 RSA has been determined to be 1,000 feet short on the Runway 10 (western) end and 793 feet short on the Runway 28 (eastern) end. The area off the Runway 10 end has an approximately 20 percent slope, and the area off the Runway 28 end has a 7.6 percent slope. There is also development around the runway that cannot be reasonably relocated, such as the highways, railroad, landfill, and housing developments.

Cultural Resources at AGC

A Programmatic Agreement made between ACAA, FAA, and the SHPO in July 2008 (amended February 2021) identifies 280 acres of the 432-acre airport property as a National Register-eligible Historic District, encompassing airport buildings, structures, and runways (**Enclosure 3**; Resources Survey Update, Number 2021SR00082). The 2021 Programmatic Agreement Amendment states that improvement to the Runway 10-28 RSA can proceed without NHPA Section 106 consultation. The 2008 Programmatic Agreement also notes that, to develop the airport, most of AGC property was cut, filled, and graded. Hilltops were removed in excess of 20 to 30 feet and the peripheries of the property were filled in excess of 30 feet, essentially eliminating the potential for finding prehistoric archaeological resources over most of the property.

Historic District. The Proposed Undertaking is not near to and would not directly or indirectly affect any designated buildings or structures, alter the existing runway, or substantially change the visual character of the Historic District. Two FAA utility sheds are within the project footprint at the Runway 28 end; however, these two sheds are not identified as features that contribute to the Historic District. Although the EMAS would be visible from the Historic District, it is not anticipated to be out of character for the airport environment.

Archaeological Resources. A desktop review of the PA-SHARE database for previously-conducted surveys and known resources for the APE and vicinity was performed in September, 2021. Archaeological surveys have been conducted at AGC; however, none are in proximity to the APE (**Enclosure 4**), and the predictive model at PA-SHARE shows a moderate probability for resources within or adjacent to the APE (**Enclosure 5**).

The Programmatic Agreement identifies historic loci at AGC. Although building surveys and known historic resources were identified as associated with the historic district designation and outlined in the Programmatic Agreement, we were unable to obtain survey or other information regarding identified historic loci for potential archaeological resources listed in the Agreement as Attachment B, Archaeological Sensitivity Map (**Table 1**).

TABLE 1. IDENTIFIED HISTORIC LOCI AT AGC

Number	Name	PHMC-cleared / Potential for Historic Resources	Located in or Directly Adjacent to Area of Potential Effect?
1.	Patterson	Loci not PHMC-cleared; No Potential	-
2.	J. Irwin	Loci not PHMC-cleared; No Potential	-
3.	W. Irwin	Loci not PHMC-cleared; No Potential	-
4.	Means	Loci not PHMC-cleared; No Potential	Yes

Number	Name	PHMC-cleared / Potential for Historic Resources	Located in or Directly Adjacent to Area of Potential Effect?
5.	W. Jack	Loci not PHMC-cleared; No Potential	-
6.	F. Jack	Loci not PHMC-cleared; No Potential	-
7.	Smith	Loci not PHMC-cleared; No Potential	Yes
8.	Deer	Loci not PHMC-cleared; No Potential	Yes
9.	Silveus	Loci not PHMC-cleared; No Potential	Yes
10.	Seibel	Loci not PHMC-cleared; Archaeological remains present	Yes
11.	Notz	Loci not PHMC-cleared; Archaeological remains present	Yes
12.	Mifflin Church	PHMC cleared, 9/8/2005	-
13.	Caretaker’s House	PHMC cleared, 9/8/2005	-
14.	Gilman	PHMC cleared, 9/17/2007	-
15.	Mifflin School	PHMC cleared, 9/17/2007	-
16.	Residence	PHMC cleared, 9/17/2007	-
17.	Residence	PHMC cleared, 9/17/2007	-

According to the Programmatic Agreement, there are two isolated historic loci north of the historic fill area adjacent to the mid-Runway 28 RSA Proposed Undertaking area identified as potentially requiring clearance by the Pennsylvania Historical and Museum Commission (PHMC) should ground-disturbing activities be planned for these areas (the Seibel Property and the Notz Property sites; **Enclosure 3**). Note that sites 1 – 9 have not been cleared by PHMC; however, they were determined in the Programmatic Agreement to have no potential for historic resources.

Although the Seibel and Notz areas are in proximity to the mid-Runway 28 elements of the Proposed Undertaking, they are estimated to be located outside of the Proposed Project footprint and the sensitive historic areas would be specifically avoided by construction activities. Furthermore, there is no excavation associated with the Proposed Undertaking as the intent is limited to the placement of fill.

We appreciate your input on the proposed RSA improvement project. If you would like additional information or to discuss the project, you can contact me at 412-472-3889 or CWillis@Flypittsburgh.com. You may email your comments and information to me or mail them to the address given below. If possible, please provide your input within 14 days of receipt of this letter.

Sincerely,

Chad A Willis

Chad A. Willis, M.A, RPA

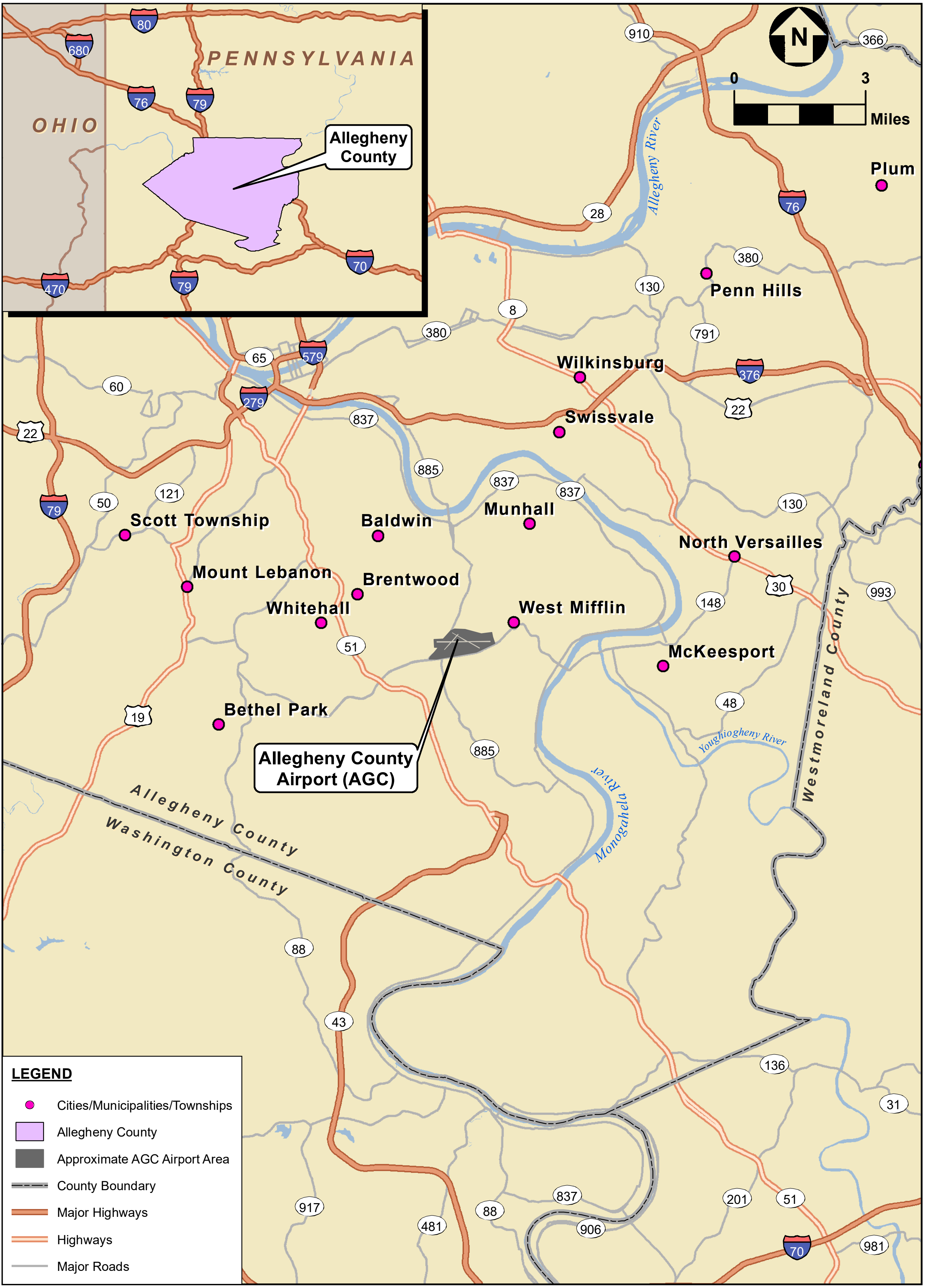
CC: Susan McDonald, Federal Aviation Administration

Enclosures:
1. Project Location
2. Proposed Development Project
3. Cultural Resources at AGC
4. Previous Archaeological Surveys at AGC (PA-SHARE)
5. Pre-Contact Probability Model at AGC (PA-SHARE)

Pittsburgh International Airport
Landside Terminal, 4th Floor Mezz.
PO Box 12370 I Pittsburgh, PA 15231-0370
(412) 472-3500 I FLYPITTSBURGH.COM

Enclosure 1

Airport Location

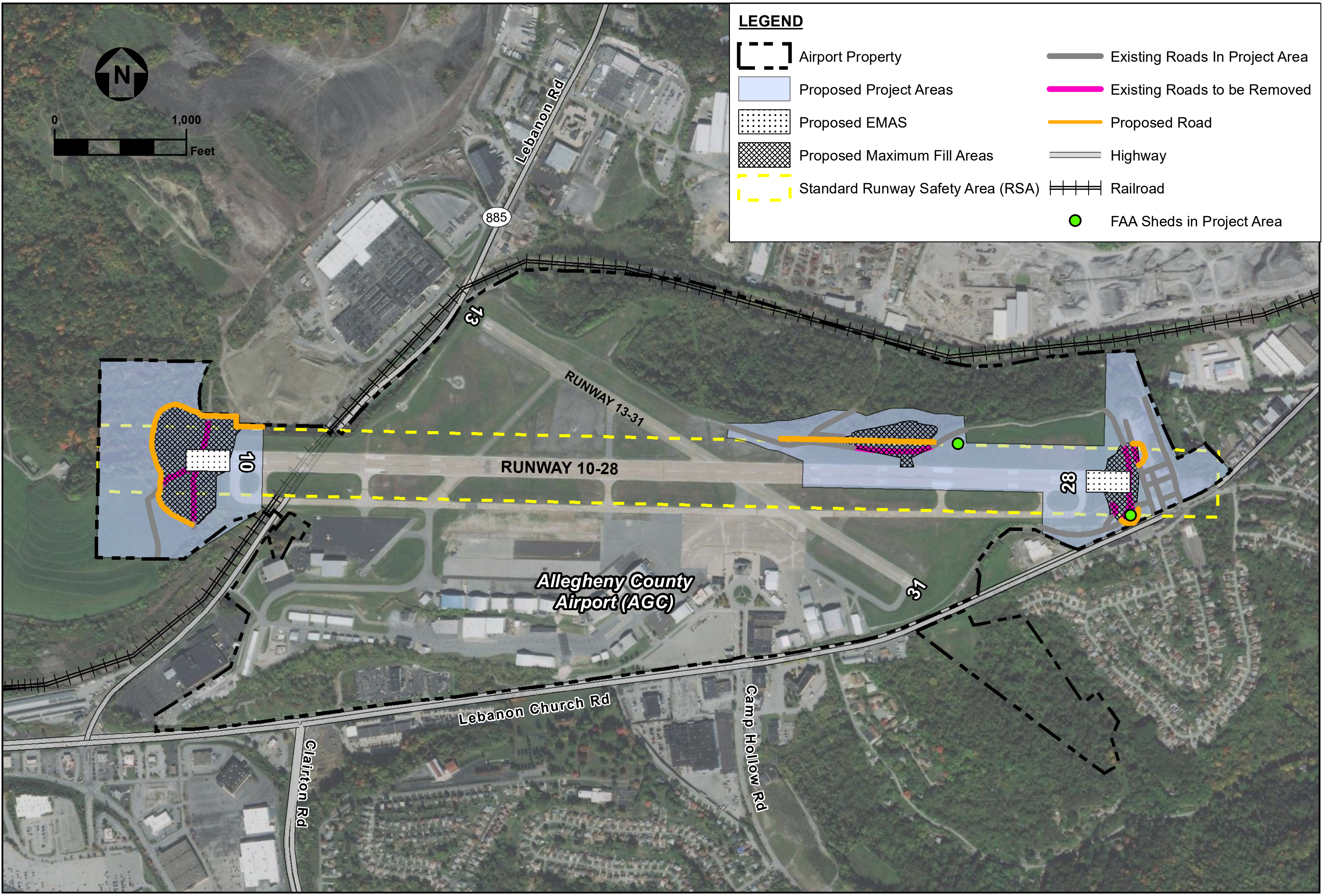


Source: Esri; ESA, 2020

AIRPORT LOCATION
ALLEGHENY COUNTY AIRPORT

Enclosure 2

Proposed Project



Date: 9/8/2021
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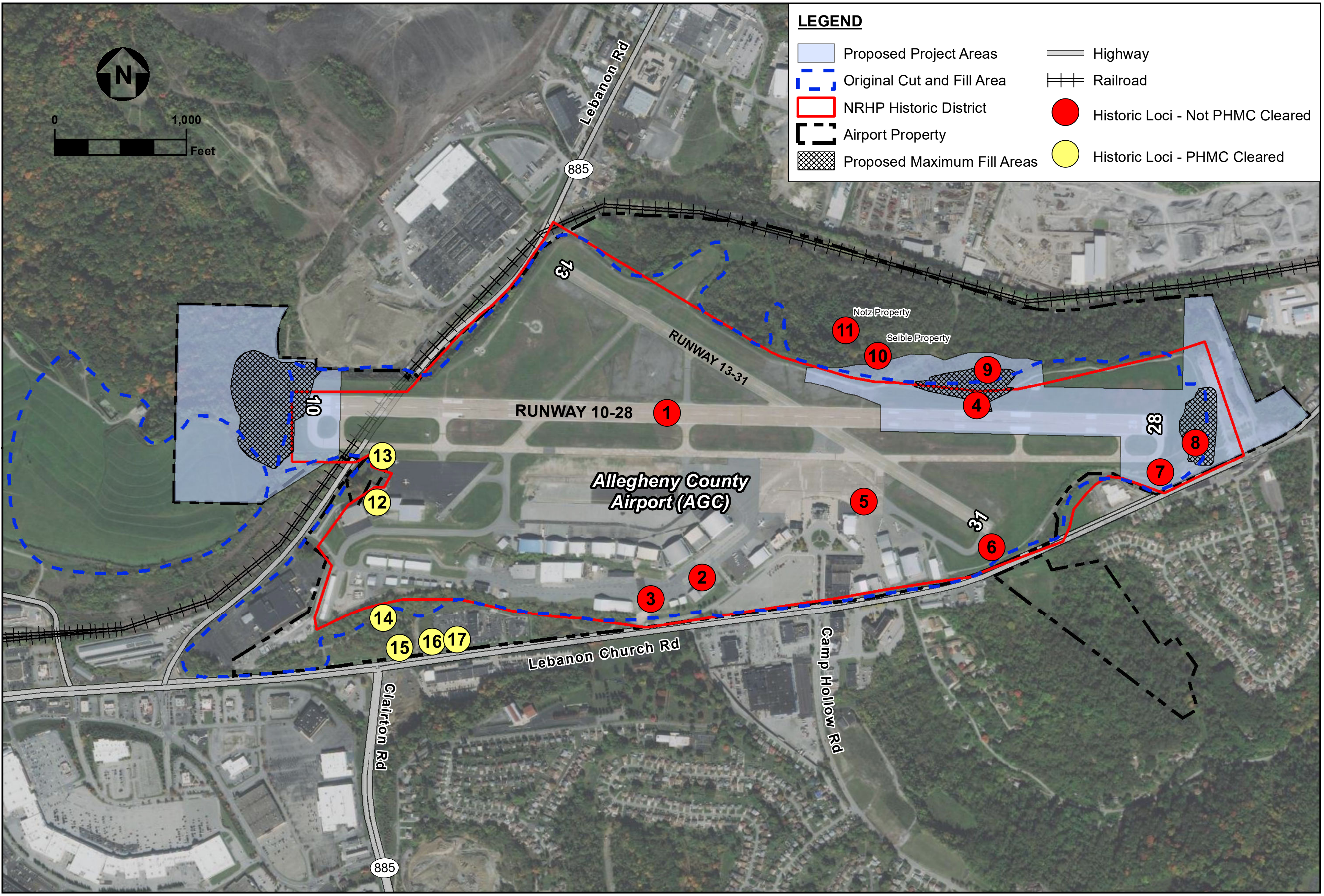
Source: Esri; GAI; Adapted by ESA, 2021.

AGC RSA EA

FIGURE #

PROPOSED PROJECT STUDY AREAS

Enclosure 3
Cultural Resources at AGC



Date: 9/8/2021
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Source: Esri; GAI; Adapted by ESA, 2021.

AGC RSA EA

FIGURE #

HISTORIC RESOURCES IN PROPOSED PROJECT AREA

Enclosure 4

Previous Archaeological Surveys at AGC

Allegheny County Airport

9/23/2021

Project Area of Potential Effect

Archaeological Resource

🟨 Historic

Archaeological Survey

Certified Local Government

County Boundaries (PennDOT)

1:18,056

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Enclosure 5

Pre-Contact Probability Model at AGC

Allegheny County Airport - Predictive Model

9/23/2021

▨ Certified Local Government

☐ County Boundaries (PennDOT)

Pre Contact Probability Model

🟥 High

🟦 Moderate

1:18,056

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix G

Detailed Traffic Analysis for Notional Haul Route Alternatives Technical Report

gai consultants

Pittsburgh Office
385 East Waterfront Drive
Homestead, Pennsylvania 15120

T 412.476.2000
F 412.476.2020

November 16, 2021

C191167.00

Mr. Nick Schubel
Project Manager, Civil
Allegheny County Airport Authority
Landside Terminal, 4th Floor Mezz.
P.O. Box 12370
Pittsburgh, PA 15231-0370

Preliminary Construction Traffic Impact Review
Allegheny County Airport Runway Safety Area Improvements Environmental Assessment

The Allegheny County Airport Authority (ACAA) is planning to construct Runway Safety Area (RSA) improvements at both ends and at a midfield location of Runway 10/28 at Allegheny County Airport (AGH). Construction is estimated to require nearly 560,000 Cu. Yd. of fill material, which will need to be transported to the site for construction. GAI Consultants, Inc. (GAI) has performed an initial construction traffic impact assessment to estimate peak hour truck traffic, to identify potential and preferred haul routes, and to determine suitable construction vehicle driveways and associated driveway improvements. Refer to Figure 1 for the project location map and Figure 2 for a site plan.

Anticipated Truck Traffic

Based on the project's cut fill report, the net required fill at the western end of Runway 10 is anticipated to be around 442,467 Cu. Yd. The net required fill at the eastern end of Runway 28 is anticipated to be around 61,239 Cu. Yd. The net required fill at the midfield location on the north side of Runway 10/28 is anticipated to be around 54,002 Cu. Yd. To provide a conservative estimate of potential traffic, standard triaxles capable of hauling 18 Cu. Yd. per trip are assumed. Estimated required truck loads are summarized in Table 1.

Table 1 – Estimated Total Truck Loads

Location	Net Fill Required (Cu. Yd.)	Truck Type	Truck Loads
Runway 10 (Western End)	442,467	Triaxle (18 Cu. Yd.)	24,582
Runway 28 (Eastern End)	61,239	Triaxle (18 Cu. Yd.)	3,403
Runway 10/28 (Midfield)	54,002	Triaxle (18 Cu. Yd.)	3,001
Total	**557,708**		**30,986**

The project schedule will be determined further on in the project development process. However, earthwork production rates can initially be assumed to be one truck per 15 minutes on average, or four trucks per typical hour. Since the RSA at the western end of Runway 10 will have separate access roads, it can be constructed independently of the fill areas at the eastern end of Runway 28 and the midfield area of Runway 10/28. Therefore, typical peak hour truck traffic is eight loads per hour, or 16 one-way trips per hour. Table 2 below provides typical two-way peak hour traffic volumes of roadways near AGC, with anticipated peak hour traffic increases during construction. Traffic data is based on PennDOT's Traffic Information Repository (TIRe). Increases are based on the most conservative assumption that all trips will be applied to each individual roadway.

Table 2 – Weekday Peak Hour Traffic Increases During Construction

Roadway	Average Daily Traffic (Current)	Average Daily Truck Traffic (Current)	K Factor[1]	Existing Peak Hour Volume	Existing Peak Hour Truck Traffic	Peak Hour Traffic Percent Increase[2]	Peak Hour Truck Traffic Percent Increase[2]
SR 0885 (Lebanon Rd) North of AGC	17,621	1,525	8	1,410	122	1.1%	13.1%
SR 0885 (Lebanon Rd) South of AGC	25,035	2,626	7	1,752	184	0.9%	8.7%
SR 0885 (Clairton Rd) South of SR 0885	14,339	619	11	1,577	68	1.0%	23.5%
SR 2040 (Lebanon Church Rd) east of SR 0885[3]	25,594	1,154	10	2,559	115	0.3%	7.0%
SR 2040 (Lebanon Church Rd) west of SR 0885	32,203	1,988	10	3,220	199	0.5%	8.0%
SR 2047 (Delwar Rd)[4]	10,186	815	11	1,120	90	0.7%	8.9%
SR 0051 (Clairton Blvd) north of SR 2040	23,684	1,390	10	2,368	139	0.7%	11.5%
SR 0051 (Clairton Blvd) south of SR 2040	26,286	2,041	7	1,840	143	0.9%	11.2%

1. K factor is the percentage of average daily traffic occurring during the peak hour.
2. Percent increase assumes eight trucks per hour (16 trips) during construction.
3. Four trucks per hour assumed since roadway is assumed to only be used by trucks to Runway 28 and Midfield locations.
4. Four trucks per hour assumed since this roadway assumed to only be used by trucks to Runway 10.

Based on Table 2, the maximum weekday peak hour traffic volume increases on any potential haul road vary from 0.3 to 1.1 percent during construction. The number of peak hour truck trips is anticipated to increase between seven and 14 percent on all major roads except for SR 0885 (Clairton Rd) south of SR 0885 which would increase nearly 25 percent. Therefore, construction trips are not anticipated to significantly degrade existing levels of service.

Potential Haul Routes

GAI has performed a cursory review of potential haul routes to identify preferred routes to avoid restrictions and other constraints. While the airport's main entrance is along SR 2040 (Lebanon Church Rd), there is no direct connection to the airfield at that entrance except through apron areas. The airfield has unpaved service roads with existing gated access points along SR 0885 (Lebanon Rd) and SR 2040 (Lebanon Church Rd). Since Runway 10/28 extends across SR 0885 (Lebanon Rd), new access will be needed to construct the RSA at the Runway 10 end. Potential access locations under evaluation are along SR 0885 (Lebanon Rd) and SR 2047 (Delwar Rd). Truck haul routes connecting to these access points will ultimately depend on material source locations, so this section investigates potential haul routes from the region's highway system to the airfield based on the following assumptions:

- Primary long-distance roads in the project vicinity consist of SR 0051 to the west and south, I-376 to the north, and SR 0837 in the Mon Valley to the east. This study examines potential connections from the airport site to those routes. While fill material may come from a source closer to the site, trucks will still likely need to use one of the connecting roads.

- State and County-owned roads are primary candidates for haul routes, though locally owned roads will be considered as appropriate.

Refer to Figure 1 for a PennDOT Functional Classification map showing a map of roads in the vicinity of AGC and their functional classifications. Posted and bonded roads are shown in Figure 3, and Surface Transportation Assistance Act (STAA) Truck Routes are shown in Figure 4. Recommended haul routes are summarized in Figure 5.

SR 0885 (Lebanon Road / Clairton Road)

SR 0885 (Lebanon Rd / Clairton Rd) runs in a north/south direction from I-376 in Pittsburgh to SR 0837 in Clairton, except for a one block stretch south of the airport where it runs east/west along Lebanon Church Rd between Lebanon Rd and Clairton Rd. SR 2040 (Lebanon Church Rd) connects to SR 0051 (Clairton Blvd). SR 0885 (Clairton Rd) also intersects with SR 0837 approximately three miles to the north of the airport. SR 0885's typical section varies as a two-lane, three-lane, and four-lane divided and undivided road. SR 0885 (Lebanon Rd) runs along the west border of the airfield south of the Union Railroad, where there is a gated access drive to the airfield, and then under Runway 10/28. Since the end of Runway 10/28 is west of SR 0885 (Lebanon Rd), the proposed RSA area can only be accessed through private property on the west side of SR 0885 (Lebanon Rd). Potential access points under consideration include connecting to the western end of Noble Dr, which has a signalized intersection with SR 0885 (Lebanon Rd) or connecting through the unsignalized South Hills Industrial Park (SHIP) driveway.

Southbound below Runway 10/28

Northbound North of Noble Dr

Westbound along Lebanon Church Rd

Southbound South of Lebanon Church Rd

Functional Classification

    - SR 0885 is classified as a principal arterial north of its intersection with SR 2045 (Mifflin Rd) and where it runs along Lebanon Church Rd. It is part of the National Highway System in these locations.
    - SR 0885 is classified as a minor arterial between SR 2045 (Mifflin Rd) and SR 2040 (Lebanon Church Rd) and between SR 2040 (Lebanon Church Rd) and SR 0837 (State St).
- Traffic Volume
    - North of the airport, SR 0885 has a 2018 ADT of 19,022 and a truck percentage of 8 percent, according to PennDOT TIRe data. This data also shows that the truck percentage has varied between 8 and 10 percent from 1989 to 2019.
    - Between the airport and SR 2040 (Lebanon Church Rd), SR 0885 has a 2018 ADT of 20,453 and a truck percentage of 10 percent.
    - South of SR 2040 (Lebanon Church Rd), SR 0885 has a 2018 ADT of 9,253 and a truck percentage of 4 percent.
- Roadway Restrictions
    - According to PennDOT's Posted and Bonded Viewer, there are no restrictions along SR 0885.
    - There is a steep hill between Noble Dr and SR 2045 (Mifflin Rd) with signage instructing trucks to reduce gear.
    - There is a steep hill approaching SR 0837 in Clairton, with existing truck warning signage indicating a 9 percent grade. The truck speed limit is posted at 20 mph, with reduced gear zone regulatory signing.
    - SR 0885 and SR 0837 are both Surface Transportation Assistance Act (STAA) Truck Routes suitable for 102" twins and 102" - 48' and 53' Trailers.
- Connecting Route Restrictions
    - SR 0885 connects with SR 0837 approximately three miles north of the airport, which provides an alternative connection to I-376 via the Homestead Grays Bridge/Browns Hill Road (County-owned) and Beechwood Blvd (City of Pittsburgh Truck Route). Beechwood Blvd in the northbound direction has an overhead bridge with a 14'-1" posting.
    - SR 0885 terminates at SR 0837 in Clairton, approximately 5 miles south of the airport. Connecting state roads, SR 2032 (Lewis Run Rd) and SR 2030 (Payne Hill Rd), are posted with 10-ton weight limits, so there are no suitable connecting roads south of SR 2040 (Lebanon Church Road)

SR 0885 (Lebanon Road) is suitable for use as a primary haul route from I-376 through the AGC property to SR 2040 (Lebanon Church Rd). The truck percentage is relatively high, and industrial businesses served by similar vehicles are located along this portion of roadway, such as a slag company. South of SR 2040 (Lebanon Church Rd), SR 0885 (Clairton Rd) runs roughly parallel to SR 0051 (Clairton Blvd). SR 0885 (Clairton Rd) has a lower truck percentage, runs through more residential land uses, and has a steep hill. Therefore, SR 0051 (Clairton Blvd) is preferable to be used as a haul route instead of the Clairton Rd portion of SR 0885.

SR 2040 (Lebanon Church Road)

SR 2040 (Lebanon Church Rd) was built as one of Allegheny County's early multi-lane roads, upgraded in the late 1930s to connect SR 0051 (Saw Mill Run Blvd) to AGC, which was Pittsburgh's primary airport until 1952. It runs along the southern airport property line. The main terminal entrance is along this road. SR 2040 (Lebanon Church Rd) consists of two lanes in each direction with a center median barrier. The multi-lane portion of the road splits at a Y-intersection at the east end of the airport property, with SR

2040 becoming Buttermilk Hollow Road as the northern leg and Lebanon Church Rd continuing as a county-owned road as the southern leg. The northern leg connects to SR 2045 (Buttermilk Hollow Rd / Mifflin Rd) and then to SR 0885. The southern leg connects to SR 2045 (Pittsburgh McKeesport Blvd) which connects to McKeesport and the Mon Valley. Just to the west of the Y-intersection is the old road alignment, Rodeo Dr (County Road), which functions as a jughandle for eastbound SR 2040 (Lebanon Church Rd) and connects to a residential subdivision. There are gated airfield access points across from both Rodeo Dr intersections with SR 2040 (Lebanon Church Rd).

Eastbound at Airport Entrance

Eastbound at Rodeo Dr (East) and Buttermilk Hollow Rd

Eastbound at Rodeo Dr (West)

Rodeo Dr Eastbound to Lebanon Church Rd

Westbound at Delwar Rd

Westbound at SR 0051 (Clairton Blvd)

- Functional Classification
  - SR 2040 (Lebanon Church Rd) is classified as a principal arterial and is part of the National Highway System. SR 2045 (Buttermilk Hollow Rd / Mifflin Rd / Pittsburgh McKeesport Blvd) is also a principal arterial. Lebanon Church Rd (County Rd) between SR 2040 (Buttermilk Hollow Rd) and SR 2045 (Pittsburgh McKeesport Blvd) is a minor arterial.
- Traffic Volume
  - Near the main airport entrance, SR 2040 (Lebanon Church Rd) has a 2018 ADT of 27,970 and a truck percentage of 6 percent.
  - West of the airport, SR 2040 becomes SR 2045 (Buttermilk Hollow Rd / Mifflin Rd) with 2018 ADT of 11,566 with a 2 percent truck percentage.
  - West of the airport, Lebanon Church Rd (County Rd) has a 2018 ADT of 12,457 and a truck percentage of 6 percent. SR 2045 (Pittsburgh McKeesport Blvd) has a 2018 ADT of 17,245 and a truck percentage of 4 percent.
- Roadway Restrictions
  - According to PennDOT's Posted and Bonded Viewer, there are no restrictions along SR 2040 (Lebanon Church Rd).
  - At the SR 0051 interchange, the SR 0051 bridge over SR 2040 (Lebanon Church Rd) has a 14 ft 3 in height restriction over the curb lane in the eastbound direction and a 14 ft 2 in height restriction over the curb lane in the westbound direction.
  - SR 2040 (Lebanon Church Rd) and SR 2045 (Buttermilk Hollow Rd / Mifflin Rd / Pittsburgh McKeesport Blvd) are not STAA listed Truck Routes, though they are part of the National Highway System.
- Connecting Route Restrictions
  - SR 2045 (Mifflin Rd) is residential within the City of Pittsburgh, with "Brake Retarders Prohibited" signage.
  - SR 2045 (Pittsburgh McKeesport Blvd) south of Lebanon Church Rd (County Rd) has a steep hill with a posted truck speed limit of 25 mph and a reduced gear zone. There is a weight restricted bridge along this stretch, posted for 22 tons and 27 tons for combinations.

SR 2040 (Lebanon Church Rd) is the primary link between the Allegheny County Airport and SR 0051. Being a multi-lane road and carrying six percent trucks, it is suitable to be the primary haul route to the airport property. Northeast of the airport, SR 2045 (Buttermilk Hollow Rd / Mifflin Rd) is more residential and has fewer trucks than parallel SR 0885 (Lebanon Rd), the latter of which is more suited to be a primary haul road. Southeast of the airport, SR 2045 (Pittsburgh McKeesport Blvd) has a weight-restricted bridge on a steep hill. SR 2040 (Lebanon Church Rd) to SR 0051 (Clairton Blvd) is a more suitable route to access the Mon Valley.

SR 2047 (Delwar Rd)

SR 2047 (Delwar Rd) is a short 0.7-mile-long road that connects SR 2040 (Lebanon Church Rd) to SR 2046 (Streets Run Rd). It consists of one lane of traffic in each direction. It starts at a Y-intersection with SR 2046 (Streets Run Road), traverses a hill, moves through a light industrial area, and has a 90-degree curver under the Union Railroad where it meets SR 2040 (Lebanon Church Rd). There is a driveway to a US Steel landfill site along this road, which could serve as an access point to reach the west end of Runway 10/28.

Northbound towards Union Railroad

Northbound towards SR 2046 (Streets Run Rd)

- Functional Classification
  - SR 2047 (Delwar Rd) is classified a major collector and is not on the National Highway System.
- Traffic Volume
  - SR 2047 (Delwar Rd) has a 2018 ADT of 9,782 and a truck percentage of 8 percent.
- Roadway Restrictions
  - According to PennDOT's Posted and Bonded Viewer, there are no restrictions along SR 2047 (Delwar Rd).
  - SR 2047 (Delwar Rd) has a steep hill between the US Steel Driveway and SR 2046 (Streets Run Rd).
  - There is a Union Railroad overpass above SR 2047 (Delwar Rd), though there is no height posting or clearance restriction. Based on a field visit, no height clearance issue is anticipated.
- Connecting Route Restrictions
  - SR 2046 (Streets Run Rd) is posted for 10 tons east of SR 2047 (Delwar Rd).
  - Trucks are unable to make a sharp turn from SR 2047 (Delwar Rd) to SR 2046 (Streets Run Rd) to the west.

SR 2047 (Delwar Rd) has an eight percent truck percentage and has light industrial facilities along its route. However, it is only suitable as a haul road from the US Steel Driveway to SR 2040 (Lebanon Church Rd). This is due to a steep grade, sharp Y-intersection, and weight restriction on SR 2046 (Streets Run Rd).

Based on this review, recommended haul routes are SR 2040 (Lebanon Church Rd) from SR 0051 (Clairton Blvd) to AGC and SR 0885 (Lebanon Rd) from SR 2040 (Lebanon Church Rd) to I-376.

Analysis of Potential Site Access Driveways

GAI met with ACAA personnel on October 15, 2021, to review locations for potential construction access driveways. The team identified sight distance limitations, investigated geometric constraints, and noted other improvements needed for driveway use. Refer to Figure 6 for a summary of anticipated site access driveways and internal haul roads.

Runway 10 from SR 0885 via Noble Drive

A potential access point for vehicles to reach the western end of Runway 10 is through the US Steel property at the western end of Noble Dr. Noble Dr's intersection with SR 0885 (Lebanon Rd) is signalized and opposite a bus garage, so larger vehicles frequently use this intersection.

Looking Towards Noble Drive from SR 0885 (Lebanon Rd)

- Driveway Sight Distance
    - The proposed driveway is to connect to the western end of Noble Dr, so driveway sight distance measurements are not applicable.
    - Noble Dr has an existing signalized intersection with SR 885 (Lebanon Rd), so sight distance constraints are assumed to be met.
    - Stopping sight distance appears to be sufficient at this location.
- Potential Mitigation
    - Signal timing adjustments may be required at the intersection of SR 0885 (Lebanon Rd) and Noble Dr.
    - Noble Dr may have to be repaved before or after construction to accommodate frequent heavy truck use.

Constructing an access road from the end of Runway 10 to Noble Dr should have minimal disruptions or require few improvements to SR 0885 (Lebanon Rd) except for potential traffic signal retiming. Noble Dr may require repaving. Suitability of this connection will ultimately depend on whether or not the Airport Authority and site contractor is able to secure an agreement to connect through private property.

Runway 10 from SR 0885 via South Hills Industrial Park (SHIP) Driveway

A potential access point for vehicles to reach the western end of Runway 10 is through the South Hills Industrial Park (SHIP). The facility functions as a distribution center and truck driving school, so the driveway currently experiences truck use. As such, no driveway improvements are assumed:

Driveway Entrance from SR 0885

Looking Left from Driveway

Looking Right from Driveway

- Driveway Sight Distance
  - SR 0885 is posted at 40 MPH, which requires 314 ft of stopping sight distance for level terrain. This required sight distance ranges from 291 ft at a 5 percent approach upgrade to 345 ft at a 5 percent approach downgrade.
  - Stopping sight distance appears to be sufficient at this location. However, since this is an uncontrolled intersection with high conflicting traffic volumes, it can be difficult for vehicles to turn out of the driveway, especially heavy vehicles that require more clearance.
- Potential Mitigation
  - There is a two-way center left turn lane through this stretch of SR 0885, so trucks can safely turn left into the existing driveway. It is more difficult for trucks to turn out since the driveway is uncontrolled and conflicting volumes on SR 0885 (Lebanon Rd) relatively high. Flagger assistance could be required during peak times.
  - South Hills Industrial Park has a lot of truck traffic, including use of various truck bays. Potential haul traffic through the facility would create conflicts with existing truck loading activities. Potential mitigation could range from coordinating with the facility to ensure truck

traffic would not conflict with the site, to limiting hours of through truck traffic, to building a haul road in the back of the site as shown:

Potential Haul Road (Red Hatch) and Lot Improvements/Restrictions (Gray Hatch)

Compared to extending Noble Dr, using the SHIP Driveway is not preferred as a suitable connection to SR 0885. Ultimately the final determination will be based on agreements with private property owners, though this access point is not under consideration at this time.

Runway 10/28 from SR 0885 via the Driveway near the Union Railroad

A potential access point for vehicles to reach the western end or midfield area of Runway 10/28 is through the existing airfield gate at the western end of Runway 13.

Airfield Driveway Entrance from SR 0885

- Driveway Sight Distance
    - SR 0885 is posted at 40 MPH, which requires 314 ft of stopping sight distance for level terrain. This required sight distance varies to 291 ft at a 5 percent approach upgrade to 345 ft at a 5 percent approach downgrade.

  - The existing driveway is near the top of a crest vertical curve and along the outside of a horizontal curve. Stopping sight distance thus appears to be sufficient at this location.
- Potential Mitigation
  - The driveway tie-in with SR 0885 would likely require improvement to be used for larger trucks.
  - Since SR 0885 has a buffer area between the travel lanes, trucks could enter this area to safely turn left into the driveway. To improve this turn, pavement markings could be adjusted to stripe a left turn lane and widen the space for trucks to turn left.
  - Trucks may have a hard time turning right out of the driveway due to the existing sharp turn from the driveway. The driveway transition requires rebuilding. Flaggers could be used to help this turn movement, pavement markings could be adjusted to give trucks a larger area to swing right, or right turns could be prohibited.

With appropriate driveway tie-in improvements, the driveway near the west end of Runway 13/31 could be suitable for site access.

Runway 10 from SR 2047 (Delwar Rd) via US Steel Driveway

A potential access point for vehicles to reach to western end of Runway 10 is through the existing US Steel property and driveway along SR 2047 (Delwar Rd). To the southeast of the driveway, there is a sharp curve with an overhead Union Railroad bridge. Based on a site visit, there appears to be sufficient clearance for triaxle trucks to proceed under the bridge without incident.

Looking East from US Steel Driveway

Looking West from US Steel Driveway

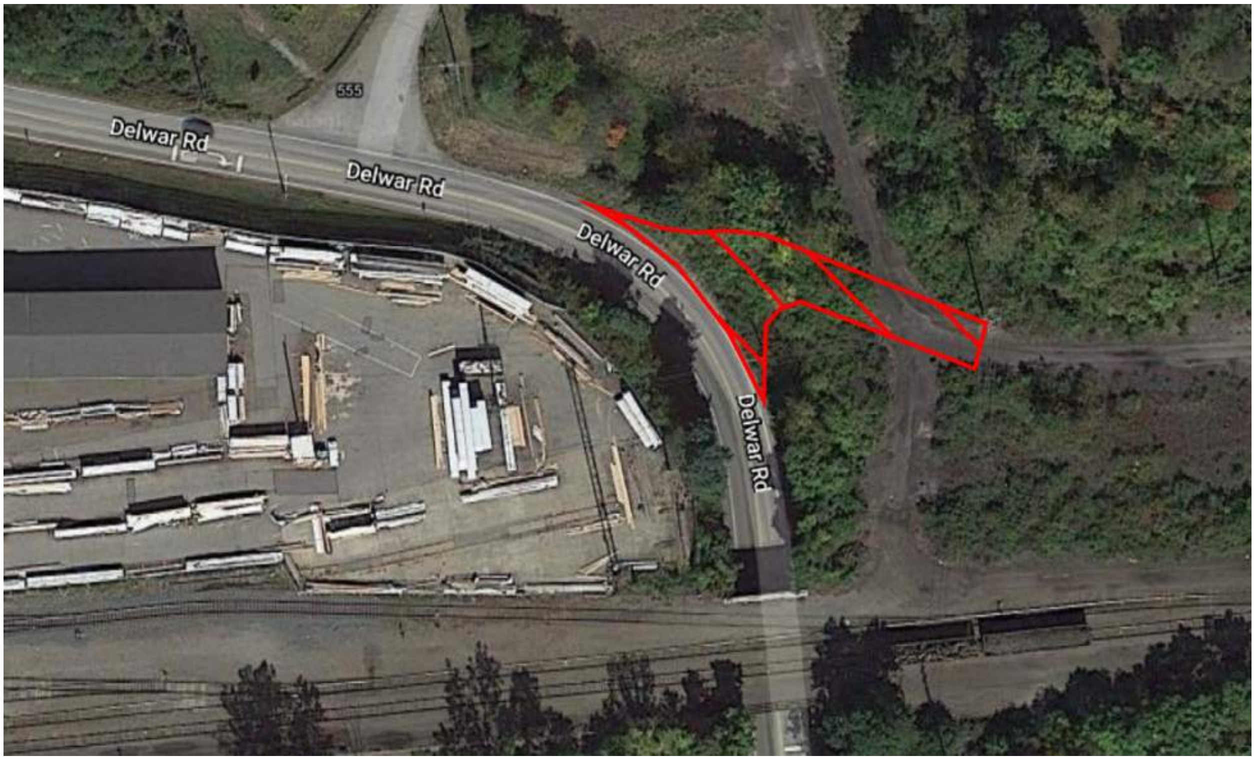
- Driveway Sight Distance
  - SR 2047 (Delwar Rd) is posted at 30 MPH, which requires 196 ft of stopping sight distance for level terrain. This required sight distance varies to 185 ft at a 5 percent approach upgrade to 210 ft at a 5 percent approach downgrade.
  - There is a horizonal curve that blocks sight distance to the east of the existing driveway. This curve has a 20-mph advisory speed, “Slow” pavement markings, and a “Caution Truck Entrance” sign. Looking left, drivers have approximately 225 ft of stopping sight distance. Should a driver stop while turning right into the driveway, vehicles behind have approximately 190 ft of stopping sight distance, though this measurement requires field verification.
  - There is a slight horizontal curve to the west of the existing driveway. Looking right, drivers should have at least 300 ft of stopping sight distance.
- Potential Mitigation

  - To improve sight distance, vegetation should be trimmed and maintained when this driveway is being used.
  - Pavement markings could be added to the driveway approach to keep trucks to the right (west) side of the driveway to maximize their sight distance.
  - Additional signing and markings could be used to provide warning to drivers.
  - If needed, flagging could supplement haul trucks during periods of high conflict.

The existing US Steel Driveway location has limited stopping sight distance, which creates borderline conditions for safe turning movements. Vegetation trimming and additional signage and pavement markings could help improve sight distance conflicts using this driveway location.

Runway 10 from SR 2047 (Delwar Rd) via a Proposed Driveway between US Steel and the Union Railroad Overpass

A potential access point for vehicles to reach western end of Runway 10/28 is through creating a new driveway along the Union Railroad to SR 2047 (Delwar Rd). The driveway would be located as to minimize impacts to overhead utilities and to maximize sight distance around the curve along SR 2047 (Delwar Rd). Such a driveway may not be practical due to the earthwork that would be required.



Proposed Driveway Location along SR 2047 (Delwar Rd)

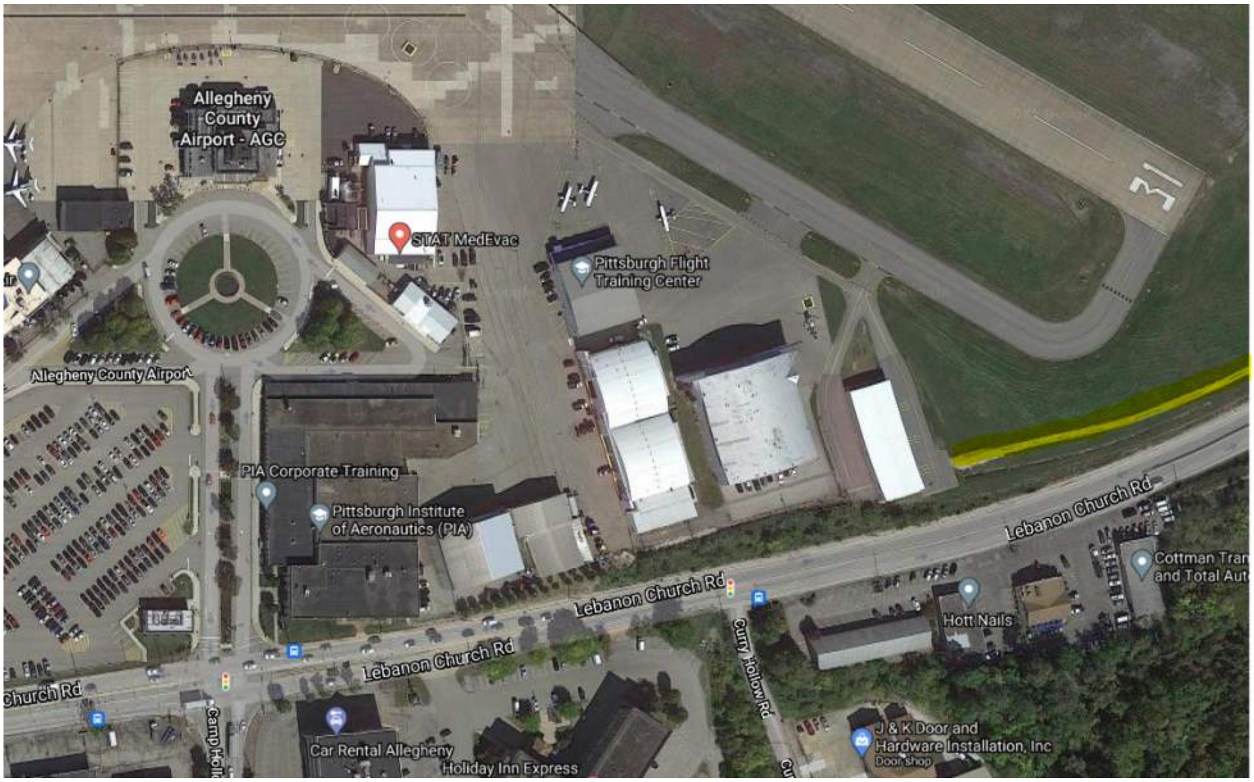
- Driveway Sight Distance
  - SR 2047 (Delwar Rd) is posted at 30 MPH, which requires 196 ft of stopping sight distance for level terrain. This required sight distance ranges to 185 ft at a 5 percent approach upgrade to 210 ft at a 5 percent approach downgrade.
  - Due to sight distance limitations, the driveway would need to be located near the point of intersection along the curve to ensure proper stopping sight distance in both directions. Constructing a driveway at this location would require earth disturbance activities.

- Potential Mitigation
  - SR 2047 (Delwar Rd) is located in a cut below the Union Railroad property, so earthwork and site grading would be required to construct a driveway at this location that meets PennDOT standards.
  - Signing and pavement markings will be required for the new driveway.

The proposed driveway location near the US Steel driveway can be constructed to minimize conflicts, though it would require hillside excavation that may not be feasible. Improving the existing US Steel driveway is preferable depending on private property agreements.

Runway 28 via Existing Airport Main Entrance

Construction vehicles could use the existing AGC main entrance to reach the midfield and east end of Runway 28, which has a signalized intersection with SR 2040 (Lebanon Church Road). While there are no conflicts or improvements required for this entrance, access through the airfield could impact airport operations. Access to a southern access road (shown in yellow) would require haul vehicles to drive past hangars on the apron. Dust mitigation may be required along the airfield road since it is unpaved. Therefore, this entrance is not feasible for use and access points closer to the end of Runway 28 should be used.



Airport Main Entrance with Access Road (Yellow Highlight)

Runway 28 via SR 2040 (Lebanon Church Rd) from Existing Driveway along SR 2040 (Lebanon Church Rd) opposite of Rodeo Drive, West

Construction vehicles could use the existing gated driveway to reach the midfield and east end of Runway 28, which connects with SR 2040 (Lebanon Church Rd) opposite the western intersection with Rodeo Dr. SR 2040 (Lebanon Church Rd) has a median barrier, so this driveway would only serve exiting vehicles turning right.

Existing Airfield Driveway Location Opposite Rodeo Drive West

- Driveway Sight Distance
  - SR 2040 (Lebanon Church Rd) is posted at 45 MPH, which requires 383 ft of stopping sight distance for level terrain. This required sight distance varies to 353 ft at a 5 percent approach upgrade to 425 ft at a 5 percent approach downgrade.
  - The driveway is located just beyond a crest of a hill, so haul road drivers should have adequate sight distance above the crest. Sight distance is assumed to be adequate.
- Potential Mitigation
  - The existing driveway crosses a sidewalk and does not have a curb cut, so the driveway tie-in would have to be improved.

The existing driveway location opposite of Rodeo Dr, West, is suitable only for vehicles exiting and making a right to Lebanon Church Rd.

Runway 28 and Laydown Area via SR 2040 (Lebanon Church Rd) from Existing Driveway along SR 2040 (Lebanon Church Rd) opposite of Rodeo Drive, East

Construction vehicles could use the existing gated driveway to reach the midfield and east end of Runway 28, which connects with SR 2040 (Lebanon Church Rd) opposite the eastern intersection with Rodeo Dr. This intersection is signalized, and Rodeo Dr (County Rd) connects residential roads and operates as a jughandle, since SR 2040 (Lebanon Church Rd) has a median barrier. There are no signal heads facing the existing driveway.

Existing Driveway Location Opposite Rodeo Dr East

- Driveway Sight Distance
  - SR 2040 (Lebanon Church Rd) is posted at 45 MPH, which requires 383 ft of stopping sight distance for level terrain. Required sight distance varies to 353 ft at a 5 percent approach upgrade to 425 ft at a 5 percent approach downgrade.
  - The driveway is located approximately 250 ft west of the signalized intersection with SR 2040 (Buttermilk Hollow Rd), which has a crest vertical curve at the intersection. There is likely insufficient sight distance to SR 2040 (Buttermilk Hollow Rd).
- Potential Mitigation
  - This driveway can function as an enter-only driveway with minimal mitigation.
  - To use this driveway for exiting trucks, the existing signal would have to be improved and signal heads installed since the driveway approach faces a signalized intersection. Right turns would be prohibited due to sight distance conflicts.
  - There is another existing curb cut 200 ft to the west which could alternately be used for right-turn-only existing traffic at this location.

The existing driveway opposite Rodeo Drive East would be suitable for an entry-only driveway, paired with the curb cut 200 ft to the west or the driveway opposite Rodeo Drive West as an exit-only driveway. To convert this driveway to full access, modification to the existing signalized intersection would be required, including adding signal heads on the driveway approach. Refer to Figure 6 for a summary of the existing and recommended driveway locations.

Summary

This preliminary construction traffic impact review for the RSA improvement project studied potential truck traffic volumes, preferred haul routes, and potential site driveway locations. Recommended haul routes are along SR 2040 (Lebanon Church Rd) to SR 0051 (Clairton Blvd) and SR 0885 (Lebanon Rd) from SR 2040 (Lebanon Church Rd) to I-376. SR 2047 (Delwar Rd) can be used to connect a potential driveway to SR 2040 (Lebanon Church Rd). Since much of the area around AGC is industrial in nature and roadways experience high truck percentages, construction trips are not anticipated to greatly impact current peak hour traffic conditions Assuming up to eight loads per hour (16 trips) during construction, these roadways will only experience about a one percent increase in overall traffic volume and less than a 15 percent increase in the hourly number of trucks. Based on the review of potential driveway locations, anticipated access locations are from west end of Noble Dr, at the existing driveway at SR 0885 (Lebanon Rd) adjacent to the Union Railroad Overpass, from the US Steel Drive along SR 2047 (Delwar Rd), and a left-in and right-out couplet opposite Rodeo Dr along SR 2040 (Lebanon Church Rd). Refer to the attached figures for a summary of these locations. With the improvements discussed in this report, the needed RSAs can be constructed while minimizing potential roadway level of service degradations.

Sincerely,

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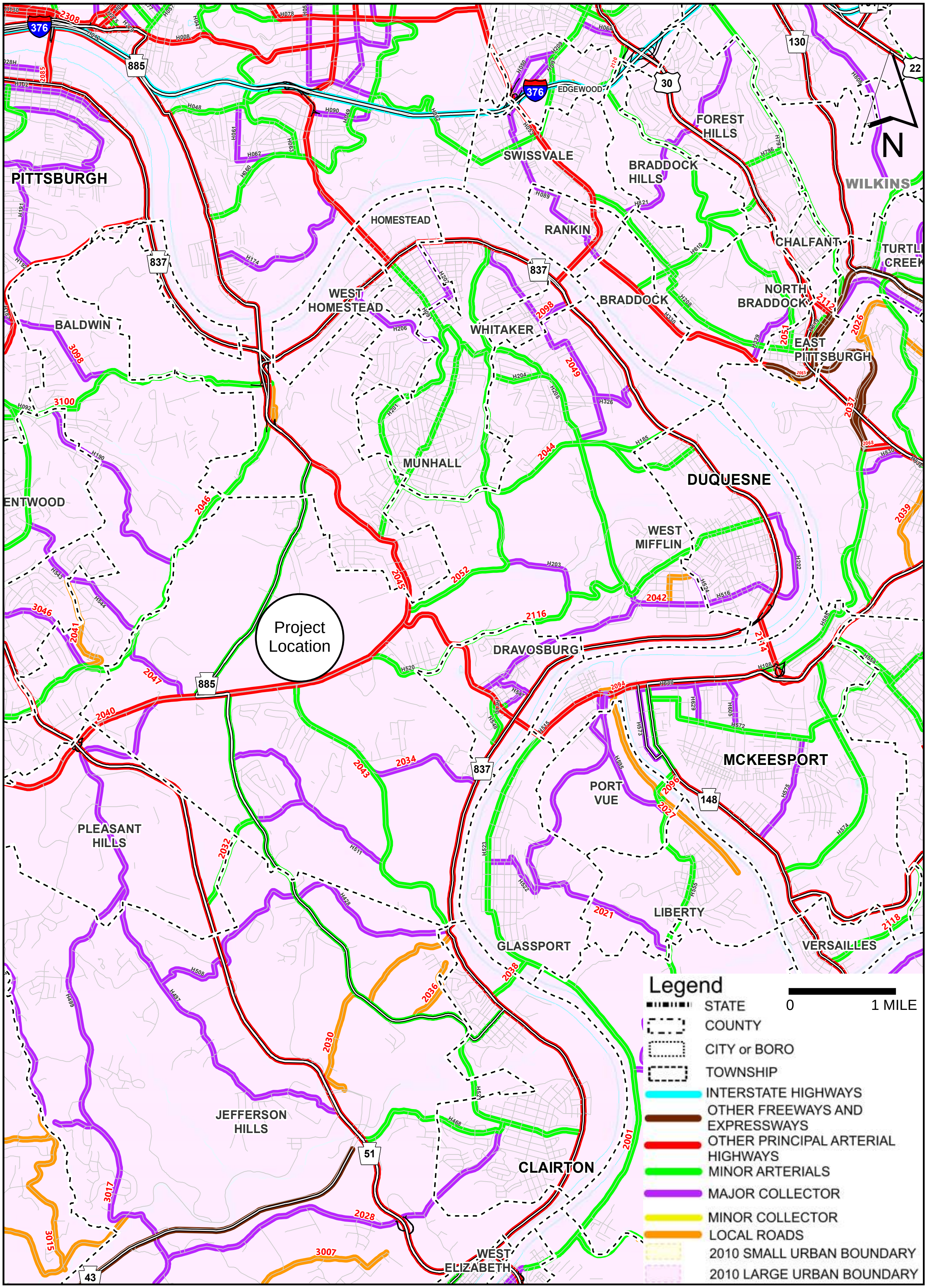
FIGURES

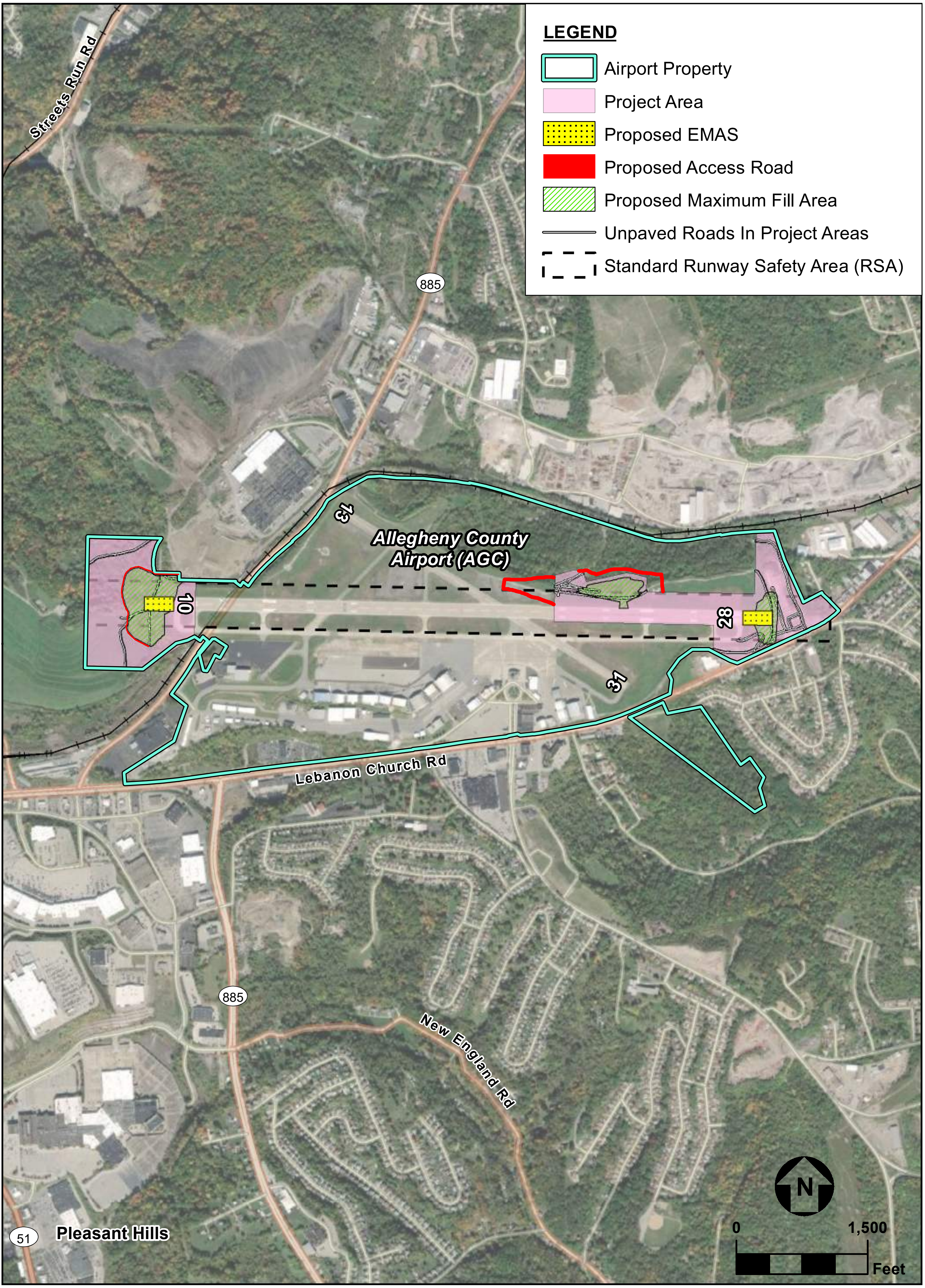


Source: PennDOT Functional Classification Map

AGC RSA EA

FIGURE 1

PROJECT LOCATION AND ROADWAY FUNCTIONAL CLASSIFICATION



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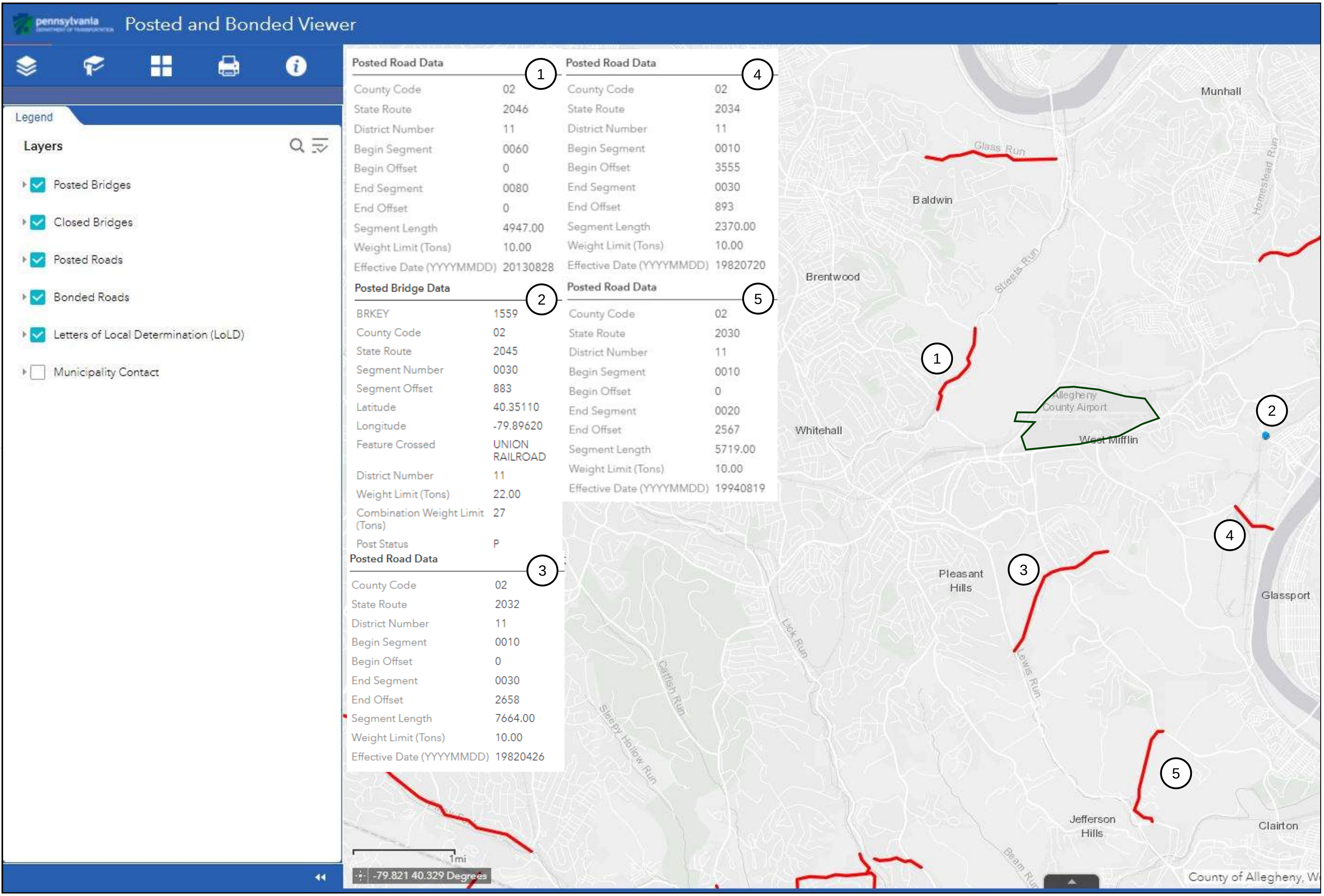
Source: Esri; GAI; Adapted by ESA, 2021.

AGC RSA EA

FIGURE 2

PROPOSED PROJECT SITE PLAN



☑ Posted Bridges
☑ Closed Bridges
☑ Posted Roads
☑ Bonded Roads
☑ Letters of Local Determination (LoLD)
☐ Municipality Contact

Posted Road Data ①

County Code	02
State Route	2046
District Number	11
Begin Segment	0060
Begin Offset	0
End Segment	0080
End Offset	0
Segment Length	4947.00
Weight Limit (Tons)	10.00
Effective Date (YYYYMMDD)	20130828

Posted Bridge Data ②

BRKEY	1559
County Code	02
State Route	2045
Segment Number	0030
Segment Offset	883
Latitude	40.35110
Longitude	-79.89620
Feature Crossed	UNION RAILROAD
District Number	11
Weight Limit (Tons)	22.00
Combination Weight Limit (Tons)	27
Post Status	P

Posted Road Data ③

County Code	02
State Route	2032
District Number	11
Begin Segment	0010
Begin Offset	0
End Segment	0030
End Offset	2658
Segment Length	7664.00
Weight Limit (Tons)	10.00
Effective Date (YYYYMMDD)	19820426

Posted Road Data ④

County Code	02
State Route	2034
District Number	11
Begin Segment	0010
Begin Offset	3555
End Segment	0030
End Offset	893
Segment Length	2370.00
Weight Limit (Tons)	10.00
Effective Date (YYYYMMDD)	19820720

Posted Road Data ⑤

County Code	02
State Route	2030
District Number	11
Begin Segment	0010
Begin Offset	0
End Segment	0020
End Offset	2567
Segment Length	5719.00
Weight Limit (Tons)	10.00
Effective Date (YYYYMMDD)	19940819

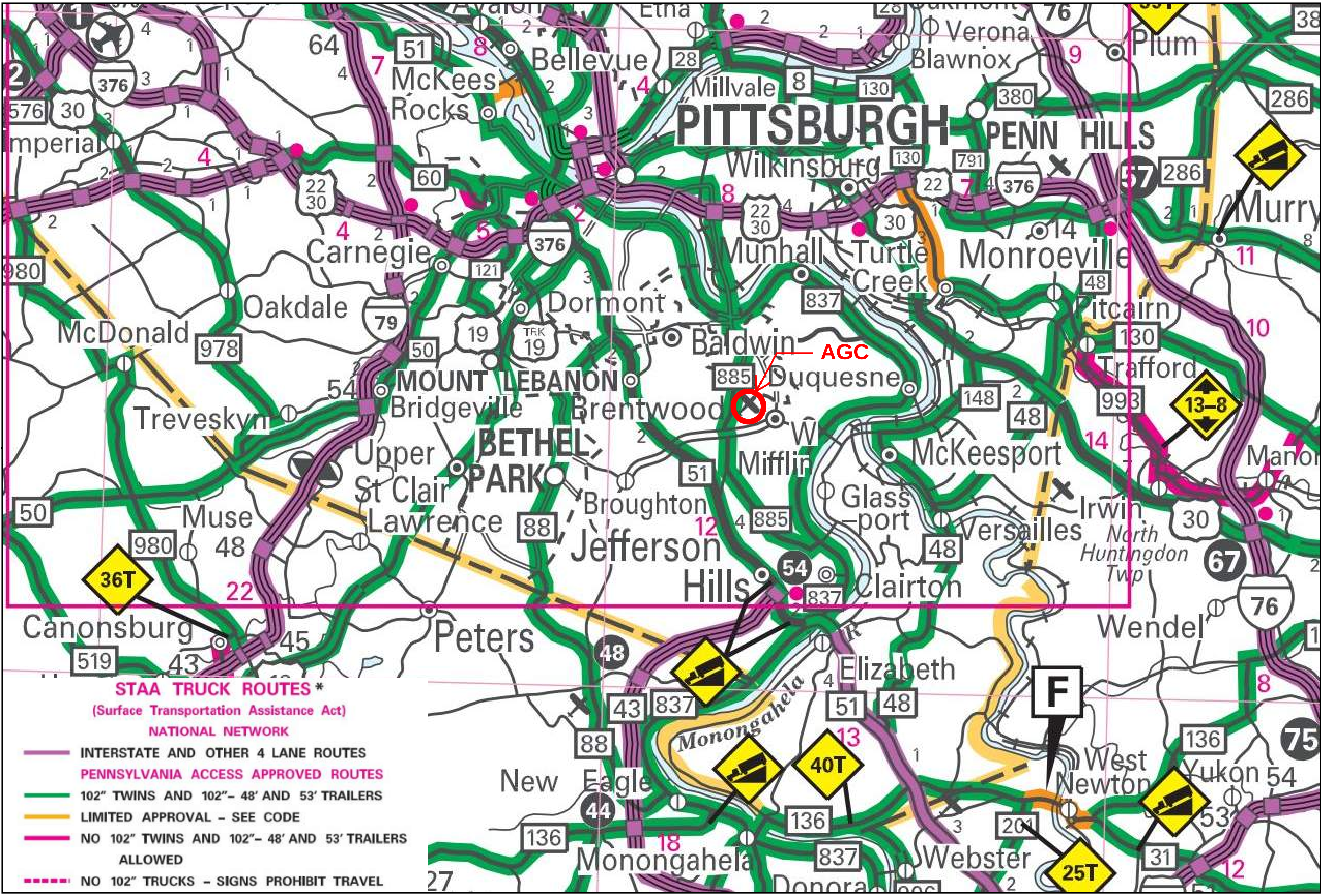
Source: PennDOT Posted and Bonded Viewer

AGC RSA EA

FIGURE 3

POSTED BRIDGES AND BONDED ROADS

Date: 11/1/2021
U:\GIS\GIS\Projects\19xxxx\D201901425_EA for AGC Runway 10-28 RSA\03_MXDs_Projects\Fig#_Proposed Project Construction Access Route Alternatives_v3.mxd

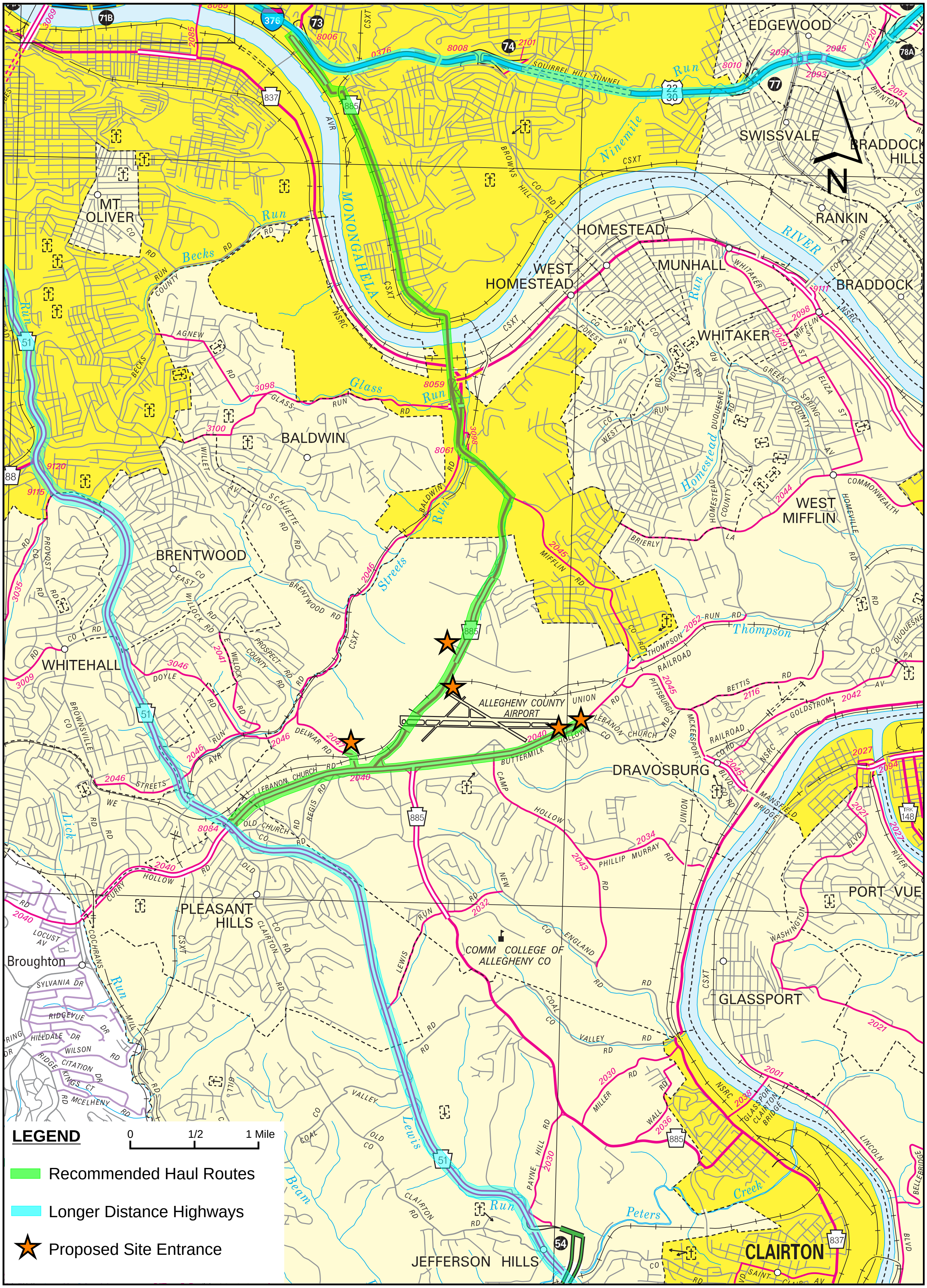


Source: PennDOT STAA Truck Routes Map

AGC RSA EA

FIGURE 4

STAA TRUCK ROUTES

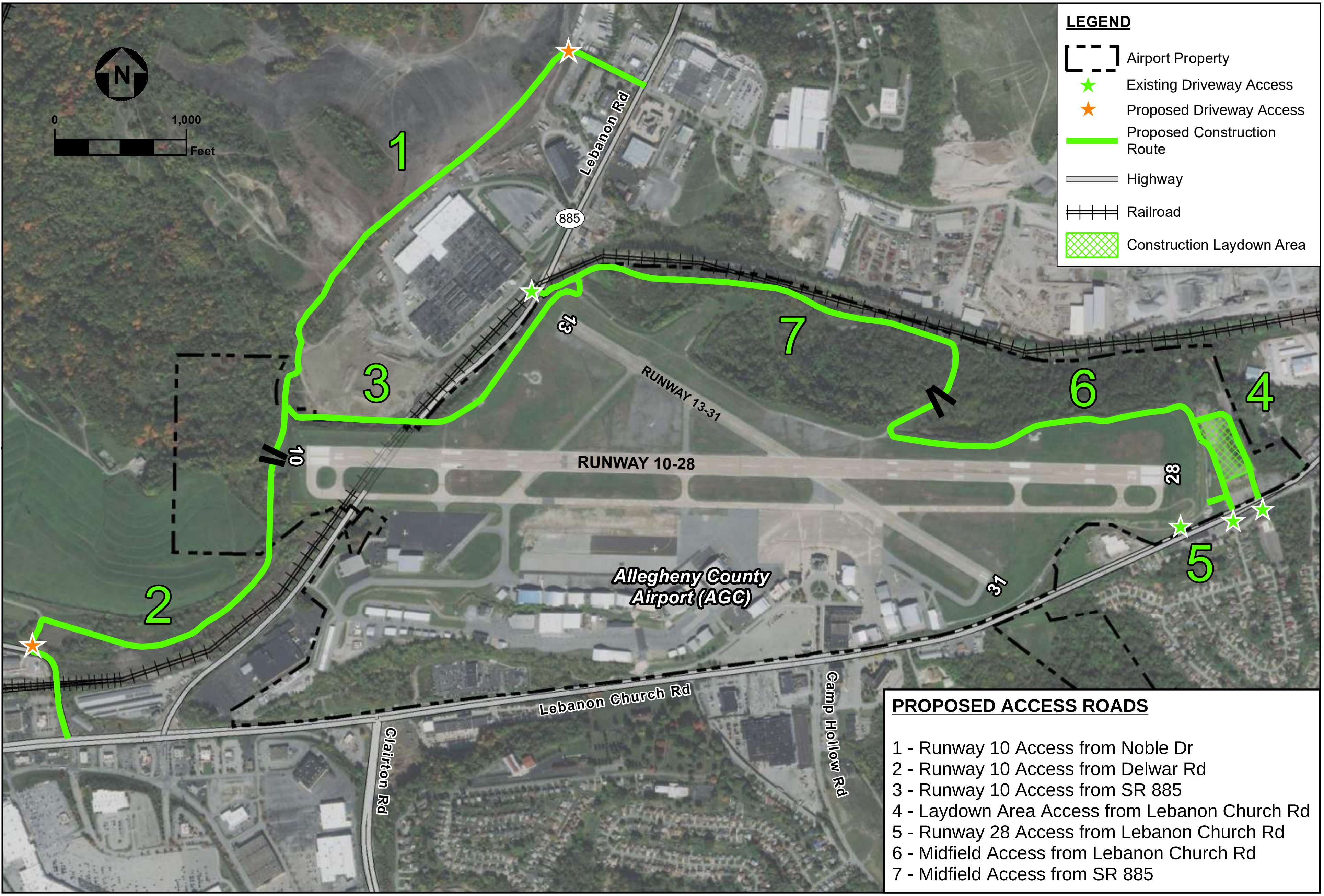


AGC RSA EA

Source: PennDOT Allegheny County Type 10 Map

FIGURE 5

RECOMMENDED HAUL ROUTES



Date: 11/1/2021
U:\GIS\GIS\Projects\19xxx\D201901425_EA for AGC Runway 10-28 RSA\03_MXDs_Projects\Fig6_Proposed Project Construction Access Route Alternatives_v3.mxd

Source: Esri; GAI; Adapted by ESA, 2021.

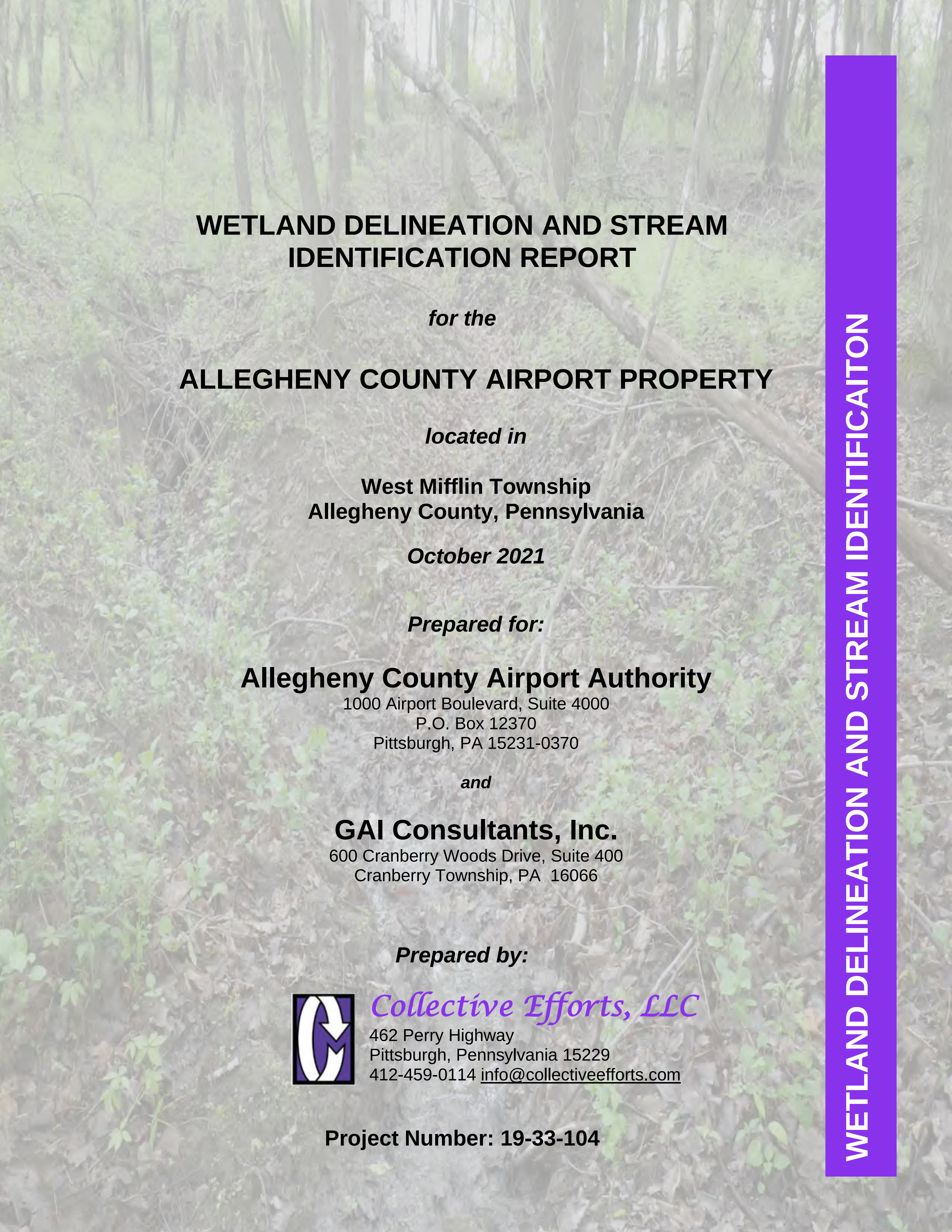
AGC RSA EA

FIGURE 6

PROPOSED PROJECT CONSTRUCTION TRUCK ACCESS ROUTES AND DRIVEWAY ALTERNATIVES

Appendix H

Wetland Delineation and Stream Identification Technical Report



WETLAND DELINEATION AND STREAM IDENTIFICATION REPORT

for the

ALLEGHENY COUNTY AIRPORT PROPERTY

located in

West Mifflin Township
Allegheny County, Pennsylvania

October 2021

Prepared for:

Allegheny County Airport Authority
1000 Airport Boulevard, Suite 4000
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600 Cranberry Woods Drive, Suite 400
Cranberry Township, PA 16066

Prepared by:

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Pittsburgh, Pennsylvania 15229
412-459-0114 info@collectiveefforts.com

Project Number: 19-33-104

WETLAND DELINEATION AND STREAM IDENTIFICAITON

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1.0 INTRODUCTION

Collective Efforts, LLC was retained by GAI Consultants Inc. (GAI) to conduct a wetland delineation and stream (aquatic resources) investigation for the Allegheny County Airport Authority's (ACAA's) Runway 10-28 Safety Area Improvements at the Allegheny County Airport (AGC) in West Mifflin, Allegheny County, Pennsylvania. This document presents the results of the wetland delineation and stream evaluation conducted for the Allegheny County Airport (AGC) property.

This report is divided into six sections. Section 1.0 contains the introduction. Section 2.0 contains the project description. Section 3.0 contains the methods and procedures for conducting the study. Section 4.0 presents the results and conclusions. Section 5.0 presents a summary of the wetlands and channels identified. Section 6.0 cites the references used for completing this report. Figures are included after the report text. Appendix A presents the full FEMA FIRM panels. Appendix B presents the site photographs. Appendix C includes the wetland data forms. Appendix D includes stream data forms. Appendix E presents Collective Efforts' wetland delineation and stream evaluation qualifications.

2.0 PROJECT DESCRIPTION

The Allegheny County Airport Authority (ACAA) proposes to improve the Runway 10-28 Runway Safety Area (RSA) at the Allegheny County Airport (AGC) to meet standards and safety requirements as established by the Federal Aviation Administration (FAA) for runways serving the types of aircraft that typically access the airport. AGC does not currently offer a runway with a standard RSA. The Proposed Project includes expanding the Runway 10 and Runway 28 RSAs with fill, installing an Engineered Material Arresting System (EMAS) at each Runway end, and widening the mid-Runway 28 RSA with fill. This fill would correct the nonstandard slope in all three areas and would correct the width in the mid-runway location and for approximately 335 feet at each runway end. The EMAS is designed specifically for AGC to compensate fully for the remaining RSA length deficits. Other related improvements include re-routing service roads; relocating airport, utility, and other infrastructure that would be impacted by the fill; and establishing stormwater management features to support the new areas as necessary.

2.1 SITE BACKGROUND

The following sections discuss the background information reviewed for this study.

2015

In May, June, and July 2015, Collective Efforts conducted a wetland delineation and stream evaluation at the approximately 500-acre site that included AGC property and safety zone areas. The property is bounded by Lebanon Church Road to the south, Lebanon Road to the west, and the Union Railroad to the north. There were no identifiable physical boundaries on the east side of the AGC property. The project boundary used for the wetland delineation and stream evaluation was based on previous mapping resources completed for AGC and property line flagging placed in the field for previous tree cutting activities.

2021

In May 2021, Collective Efforts conducted a wetland delineation and stream evaluation at the AGC property to support the preferred alternative described in the AGC Master Plan Update prepared on November 2, 2018. The Proposed Project includes expanding the Runway 10 and Runway 28 RSAs with fill, installing an Engineered Material Arresting System (EMAS) at each Runway end, and widening the mid-Runway 28 RSA with fill.

Figure 1 shows the approximate location of the study area on the United States Geological Survey (USGS) Glassport quadrangle. Figure 2 shows the general vicinity of the study area on aerial imagery. The approximate site location coordinates of the west portion of the project area are 40° 21’15” N and 79° 56’ 31” W. The west portion of the study area is approximately 48 acres and is bound by the South Taylor Environmental Park Landfill Site. The coordinates of the east portion of the project area are 40° 21’15” N and 79° 55’ 03” W. The east portion of the study area is approximately 36 acres and is bounded by Lebanon Church Road to the south and includes an area that formerly contained a trailer park.

Prior to conducting the field investigation, a background review was conducted. This consisted of reviewing National Wetland Inventory (NWI) mapping, the Natural Resources Conservation Service (NRCS) Web Soil Survey, and Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) mapping. The results of the background review are discussed in the following subsections.

2.2 NWI Mapping Results

As part of the background review the NWI mapping was reviewed for the study area. No wetland areas were identified on the mapping within the study area. The wetland information was reviewed on the NWI website (http://www.fws.gov/wetlands). The NWI mapping is not an all-inclusive summary of existing wetlands. Typically, only larger wetlands tend to be shown on the NWI mapping. Field verification is required to accurately determine the presence of wetlands. Figure 3 notes that the review of the NWI and FEMA Mapping has revealed that there are no NWI features, or floodplains present on the site.

2.3 Allegheny County Soil Survey Results

The NRCS Web Soil Survey (www.soils.usda.gov) was reviewed as part of the wetland delineation and used to identify soil mapping units within the site. Seven soil mapping units were identified in the investigation area; these are summarized on Table 1 and are described below. Table 1 also indicates if the soil type is listed on the federal, state or local hydric soils lists. The specific soil types found at the individual wetland sampling stations will be discussed in Section 4.0 “Results and Conclusions.” Figure 3 identifies the location of the soil types identified throughout the study areas and the surrounding area.

Table 1
NRCS Soil Types Identified in the Wetland Delineation and Stream Identification Report for AGC

Soil Symbol	Soil Type	Slope (%)	Texture	Soil Listed on Hydric Soils List		
				County	State	Federal
CuD	Culleoka channery silt loam	15 to 25	Channery silt loam to very channery silt loam	-	-	-
CwB	Culleoka-Weikert shaly silt loam	3 to 8	Channery silt loam	-	-	-
DoD	Dormont silt loam	15 to 25	Silt loam to silty clay loam	X	-	-
GSF	Gilpin, Weikert and Culleoka channery silt loam	25 to 80	Channery silt loam	-	-	-
UCD	Urban land-Culleoka complex, moderately steep	8 to 25	Channery silt loam	-	-	-
UCE	Urban land-Culleoka complex, steep	25 to 65	Silt loam to channery silt loam	-	-	-
UGB	Urban land-Guernsey complex, gently sloping	0 to 8	Silt loam to silty clay	X	-	X

<u>Culleoka silt loam (CuD)</u>

The Culleoka silt loams are moderately deep and well-drained soils and are typically found on uplands. The parent material, shale bedrock, is at a depth of 28 inches. The permeability is moderately rapid, and the available water capacity is moderate. Runoff is rapid for CuD soils. The hazard for erosion increases as the slope where the soils are located increases. Therefore, the erosion hazard is very severe for CuD soils. The slope and depth to bedrock are limitations for development in these soils. Culleoka silt loam is not listed on the Allegheny County, state, or federal hydric soil lists.

<u>Culleoka-Weikert shaly sit loams (CwB)</u>

This gently sloping complex (3 to 8 percent slopes) is generally on the crest of ridges or in long, narrow, contour areas on hillsides. Slopes are convex. This soil type is well-drained, and runoff is slow to medium. The permeability is moderate. Shallow to moderate depth to bedrock is a limitation for community development and recreation use. Culleoka-Weikert shaly silt loam is not listed on the Allegheny County, state, or federal hydric soil lists.

Dormont silt loam (DoD)
Dormont silt loams are deep and moderately well drained soils and are typically found on uplands. This soil type with slopes of 15 to 25 percent (DoD) was found within the site. The permeability of the soils is slow, and the available water capacity is high. Runoff is medium. A seasonal high-water table is at a depth of 18 to 36 inches. A seasonal high-water table, slow permeability, and slope are limitations for community development and recreation use. DoD soils have inclusions of hydric components (wet areas) in depressions and swales according to the Allegheny County soil survey and state hydric soils lists. This soil is not listed on the national hydric soils list.

Gilpin, Weikert, and Culleoka silt loams (GSF)
Gilpin, Weikert and Culleoka (GSF) soil is typically located in long, narrow, contour areas on valley sides that parallel streams. The composition of the soil varies from northern to southern Allegheny County. The surface runoff is rapid to very rapid. This soil is not listed on the Allegheny County, state, or national hydric soils lists.

Urban land-Culleoka Complex (UCD/UCE)
Urban land-Culleoka complex, has natural soils and underlying bedrock that have been cut from places and used as fill for others. This fill material is strongly acidic to extremely acidic. This soil is found at the top of ridges or on hillsides. Slopes range from 8 percent to 25 percent (UCD), and 25 to 80 percent (UCE). This complex of soils is made up of 75 percent Urban land, 15 percent Culleoka soils, and 10 percent other soils. Areas with this soil are usually covered by buildings or other structures. UCD and UCE soils are not listed on the Allegheny County, state, or national hydric soils lists.

Urban land-Guernsey Complex (UGB)
Urban land-Guernsey Complex (UGB) soil is located on top of ridges or on hillsides. The complex is about 75 percent Urban land, 15 percent Guernsey soils, and 10 percent other soils. The soils and bedrock have been cut from some places and used as fill in other places. Areas with this complex are variable and onsite investigation is required to determine the kind and degree of limitations for land use. UGB soils are listed on the Allegheny County, state, and national hydric soils lists.

2.4 FEMA FIRM Map Results

As part of the background review, the FEMA Map Service Center (www.fema.gov) and FEMA FIRM map number 42003C0481H and 42003C0477H were reviewed for the study area. This source of information was reviewed to identify if any limits of the 100-year floodplain would impact the proposed water line corridor. The results of the search identified that no portions of the study area are located within special flood hazard areas as noted on Figure 3. Appendix A presents the full FEMA FIRM panels from the National Flood Hazard Layer (NFHL) viewer.

3.0 METHODS AND PROCEDURES

The methods and procedures that Collective Efforts used to conduct the wetland delineation and stream identifications are discussed in the following subsections.

3.1 Wetland Delineation

The wetland delineation was evaluated using the protocols established in the 1987 Corps of Engineers Wetlands Delineation Manual (Corps Manual) and with supplemental guidance based on the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region April 2012. Based upon the Corps Manuals, three factors must be present for an area to be considered a wetland:

- Wetland vegetation (hydrophytic, or water-loving vegetation)
- Wetland hydrology (capable of sustaining wetland vegetation)
- Wetland soil (hydric)

Descriptions of each of these three factors are presented in the following subsections. During a wetland delineation, sampling stations are established within the site to evaluate the presence of the three wetland factors.

3.1.1 Wetland Vegetation

The vegetation at a site is evaluated to determine if it is hydrophytic or occurs in areas where frequent flooding is a controlling influence on the plant species present. The existing vegetation is identified and then assigned an “indicator category,” as specified in the Corps Manual and referencing the U.S. Army Corps of Engineers (USACE) *2014 National Wetland Plant List*. The indicator categories classify the plant as typically occurring in a wetland or typically occurring in an upland. The indicator categories are listed on the following table.

Table 2
Wetland Vegetation Indicator Categories

Indicator Category	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur in wetlands 99%
Facultative Wetland Plants	FACW	Plants that occur in wetlands 67% to 99%
Facultative Plants	FAC	Plants that occur in wetlands 33% to 67% or plants that occur in uplands 33% to 67%
Facultative Upland Plants	FACU	Plants that occur in uplands 67% to 99%
Obligate Upland Plants	UPL	Plants that occur in uplands 99%

The Corps-approved methods for determining hydrophytic vegetation include the following:

- Rapid Test for Hydrophytic Vegetation – all dominant plant species observed are either OBL or FACW.
- Dominance Test – greater than 50 percent of the dominant plant species are classified as OBL, FACW, or FAC.
- Prevalence Index – The prevalence index (PI) is a weighted average of the wetland indicator status of all species in a sample plot. The vegetation is considered to be hydrophytic if the PI is 3.0 or less.
- Morphological Adaptations – physical characteristics of plants that have adapted to living in wetlands, including buttressed trunks, multi-stemmed trunks, shallow root systems, etc.

3.1.2 Wetland Hydrology

The hydrology at each sampling station in a site is evaluated to identify if the site shows signs of periodic inundation or if the surrounding soil appears to be saturated for some period during the growing season. Sources of water and hydrologic indicators are identified. Some primary hydrologic indicators include surface water, soil that is saturated in the upper 12 inches, watermarks, drift lines, algal mats, iron deposits, aquatic fauna, true aquatic plants, sulfidic odor, and oxidized rhizospheres on living roots. Secondary hydrologic indicators include surface soil cracks, crayfish burrows, stunted or stressed plants, geomorphic position, etc.

If a sampling station exhibits one or more of the primary hydrologic indicators or two or more of the secondary hydrologic indicators, it meets the criteria for wetland hydrology.

3.1.3 Wetland Soil

Wetland soil or hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions. Through time, the anaerobic or oxygen-free soil favors the growth of hydrophytic vegetation. Hydric soils may be classified into two categories: organic and mineral. Organic soils develop under conditions of nearly continuous saturation or inundation. These types of soils are typically called peats and mucks. Mineral hydric soils have a wide range of textures and colors. They are composed mainly of clay, silt, and/or sand with varying amounts of organic matter. These soils are saturated long enough to produce soil properties associated with a reducing or oxygen-deficient environment.

Hydric soils are indicated regionally by national and local classifications developed by the United States Department of Agriculture. There are many field indicators of hydric soils including: organic soils (organic horizon greater than 16 inches in the upper 32 inches – peats or mucks); histic epipedon (an eight to 16-inch organic horizon at or near the surface that is saturated for 30 or more consecutive days); sulfidic material (contains hydrogen sulfide with its characteristic rotten egg odor); loamy gley matrix; etc.

If a sampling station exhibits one or more of the hydric soil indicators, it meets the criteria for wetland soil.

3.2 Stream Identification

Locations of streams were identified during field activities for the project. Collective Efforts conducted the stream evaluation using the stream evaluation protocols published in the U.S. Environmental Protection Agency's *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*.

Physical characteristics and water quality of the streams were evaluated using Form 1 of the U.S. Environmental Protection Agency's *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers* manual. Water quality parameters including temperature, specific conductivity, pH, were collected in-situ at each sampling location utilizing a handheld Oakton. This monitoring instrument was maintained, operated, and calibrated per the manufacturer's instructions.

A habitat assessment was performed at each site to characterize physical qualities such as watershed features, riparian vegetation, in-stream features, aquatic vegetation, and substrate characteristics. A Habitat Assessment Field Datasheet (Form 2 or 3) for either high-gradient or low-gradient streams was completed for each channel. Using the Habitat Assessment Field Data Sheet, various parameters of a channel sampling reach were visually evaluated in the field based on the criteria outlined on the datasheet. Each parameter is rated and categorized on a numerical scale of 0 to 20, with 20 being the highest score. The condition categories include optimal, suboptimal, marginal, or poor. The scores for each parameter were individually calculated and then summed to calculate a final score for the channel sampling reach. Higher scores indicate an increase in habitat quality. Habitat Assessment Field Datasheets for each channel are presented in Appendix D.

4.0 RESULTS AND CONCLUSIONS

The results of the wetland and stream investigation for the AGC property and the conclusion as to whether the site contains wetland areas and/or streams are discussed in the following sections. An overall view of the identified wetlands and streams is presented on Figure 4.

4.1 Wetland Delineation Findings

The wetland delineation field investigation was conducted on May 20 and 25, 2021 by Ms. Rachel Galloway, Mr. Dominic Costantini, and Ms. Brianna Shea of Collective Efforts. The field results for the two sample points observed are presented in the following paragraphs. Photographs of the wetland areas are presented in Appendix B. The wetland data sheets that document the field results discussed below are included in Appendix C.

4.1.1 Wetland Study Area 1 (SP-1)

A sampling station was established in the study area on May 21, 2021. This sampling station was designated as SP-1 (Photograph 1-4) and was located roughly 625 feet northwest of the northwestern corner of the west end of runway 10-28. This sample point is also located between Channel 4 and Channel 5 on a hillslope. Figure 5 identifies the locations of SP-1 and UPL-1, as well as the streams identified on the west study area. Descriptions of the observed vegetation, hydrology, and soil are presented in the following paragraphs.

Vegetation

In general, vegetation in the study area was typically wet. No vegetation was identified or recorded in the tree or woody vine stratums. The dominant vegetation in the sapling/shrug stratum included *Lonicera japonica* (Japanese Honeysuckle, FACU). The dominant vegetation in the herb stratum included *Solidago gigantea* (Late Goldenrod, FACW), *Carex stipata* (Stalk-Grain Sedge, OBL), and *Carex vulpinoidea* (Common Fox Sedge, OBL). Other plant species identified in the herb stratum included *Equisetum arvense* (Field Horsetail, FAC), *Impatiens capensis* (Spotted Touch-Me-Not, FACW), and *Eupatorium perfoliatum* (Common Boneset, FACW). Using the dominance test for hydrophytic vegetation, the review of the vegetation indicated that the dominant plants were hydrophytic. SP-1 met the criteria for wetland vegetation.

Hydrology

SP-1 is located between Channel 4 and Channel 5 on a hillslope in a well-vegetated pocket with damp ground. Primary hydrologic indicators included a high water table at 8-10 inches and saturation present at 0 inches. Secondary hydrologic indicators included geomorphic position and the FAC-Neutral Test. SP-1 met the wetland criteria for hydrology.

Soil

The first four inches of soil consisted of a saturated, silty clay material characterized by a 90 percent 10YR 2/1 hue, value, and chroma in the Munsell Soil Color Chart with ten percent 7.5 YR 3/3. From four to ten inches deep the soil was a saturated, silty clay characterized by a 95 percent 10YR 3/1 hue, value, and chroma in the Munsell Soil Color Chart with a five percent redox feature of 7.5 YR 3/4. From ten to 18 inches deep the soil was a saturated, silty clay characterized by a 100 percent Gley 1 4/N. No restrictive layer was present, and soils were saturated throughout. The soils observed qualifies as a redox dark survey and loamy gleied matrix Referring to the NRCS Soil Survey, this study area overlays UGB and UCE soils. Neither UGB or UCE soils are included on the Allegheny County and state hydric soils lists. This soil present at SP-1 met the wetland criteria hydric soil.

Field Findings

SP-1 met all three wetland criteria and was therefore identified as a wetland, WET-1. This wetland was classified by Collective Efforts' delineators as a persistent palustrine emergent (PEM1) wetland because it is a non-tidal wetland dominated by persistent herbaceous hydrophytes. The approximate limits of this wetland fall within a total area of 0.06 acres and recorded using GPS. The location of WET-1 and the associated sample and upland points are shown on Figure 5.

4.2 Stream Identification Findings

The following paragraphs discuss the streams observed during the field review of the study area. Please note that during the field survey of the site, any area that was observed to have a defined bed and bank was listed as a channel. Channels were then determined to either be “natural stream channels” or “other surface waters” (OSW) which includes man-made channels for stormwater conveyance. The channels observed were unnamed tributaries eventually leading to the Monongahela River or Streets Run. Streets Run is a tributary to the Monongahela River. Streets Run and the Monongahela River are designated as a Warm Water Fisheries (WWF) under Chapter 93 of the Pennsylvania Code. All channel locations encountered during the field view are depicted on Figures 5-7. Photographs of the channel locations are presented in Appendix B. The physical characterization/water quality field data sheets and habitat assessment field data sheets provided the information to determine whether each stream was perennial, intermittent, or ephemeral. These forms document the field results discussed below and are included in Appendix D.

4.2.1 Channel 1 (CH-1)

Channel 1, designated as CH-1 is a man-made OSW channel that flows west parallel to Lebanon Church Road on the southwest side of runway 10-28. (Photographs 5-6). Channel 1 is a steep stream channel used to convey stormwater flow during rain events from the southwest end of the runways. The channel is approximately five feet wide with a channel depth of two feet. The substrate consisted of mostly gravel and sand with some cobble and sand. No flowing water was present in the channel at the time of observation. It had not rained in the 24 hours leading up to the time of observation. The contributing hydrology is from stormwater outfalls and contributing surface drainage. The approximate location of Channel 1 is shown on Figure 5. A Habitat Assessment Field Data Sheet form was completed for a representative sampling reach of Channel 1. Channel 1 received a total score of 79.

4.2.2 Channel 2 (CH-2)

Channel 2, designated as CH-2 is a man-made OSW channel that flows northwest located roughly 190 feet northwest from the west end of Channel 1, Channel 2 is adjacent to the South Taylor Environmental Park Landfill Site fencing (Photographs 7-8). Channel 2 was labeled OSW because of the culverted pipes at each end of the stream and geotextile lining on the bed. The approximate location of Channel 2 is shown on Figure 5. Channel 2 is approximately one foot wide with a channel depth of six inches and banks with one-to-one slopes. The substrate is primarily sand, clay, and gravel with silt and cobble. No flowing water was present in the channel at the time of observation. It had not rained in the 24 hours leading up to the time of observation. No wildlife or macroinvertebrates were observed during the time of observation. The small defined channel flows into a 24-inch steel intake. This channel is visible on aerial imagery. The contributing hydrology is from surface water from surrounding slopes. A Habitat Assessment Field Data Sheet form was completed for a representative sampling reach of Channel 2. Channel 2 received a total score of 71.

4.2.3 Channel 3 (CH-3)

Channel 3, designated as CH-3, is a natural perennial stream channel that flows northwest down steep wooded hillslopes (Photographs 9-10). The upper segment of the channel had minimal flow, but water increased as the stream flowed downhill. At the bottom of the hillslope, Channel 3 combines with Channel 4 outside of the study area, as shown on Figure 5. Channel 3 is an unnamed tributary that eventually flows to the Streets Run and the Monongahela River. Based on the representative sample reach, the channel is approximately six feet wide with a channel depth of two feet. The substrate is comprised mostly of bedrock, cobble, gravel with some boulder and small amounts of silt and clay intermixed. Macroinvertebrates were observed in the substrate, including scuds and water beetles. The characteristics of this channel include steep banks with exposed roots and erosion present. Small pools were present throughout, along with fallen trees, and algae on substrate. The contributing hydrology is from groundwater and surrounding surface water. A Habitat Assessment Field Data Sheet form was completed for a representative sampling reach of Channel 3. Channel 3 received a total score of 85.

4.2.4 Channel 4 (CH-4)

Channel 4, designated as CH-4, is a natural perennial stream channel that flows southwest and intersects with Channel 3 at the bottom of the hillslope outside of the study area, as shown on Figure 5. (Photographs 11-13). It is an unnamed tributary that eventually flows to Streets Run and the Monongahela River. Multiple channels were observed flowing into Channel 4 including Channel 5, Channel 6, Channel 7, and Channel 8. At the representative sampling location, the channel is approximately ten feet wide from bank to bank with a channel depth of four feet. The substrate is mainly comprised of bedrock and clay with gravel and silt. The channel flow was low to moderate with shallow slopes, and minimal erosion on both sides of the bank with fallen trees throughout. At the time of observation, the flow width was approximately three inches with a flow depth of one to two inches. Scuds were the only macroinvertebrates observed in the channel at the time of the site visit. The contributing hydrology to this channel is groundwater seep and surrounding surface water, which also contributes to WET-1 (Photograph 14). The approximate location of Channel 4 is shown on Figure 5. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 4. Channel 4 received a total score of 110.

4.2.5 Channel 5 (CH-5)

Channel 5, designated as CH-5, is a natural perennial stream channel that flows west into Channel 4, as shown on Figure 5. (Photograph 15-16). Channel 5 flows directly through the identified wetland WET-1. Channel 5 is an unnamed tributary that eventually flows to Streets Run and the Monongahela River. The channel is approximately four feet wide from bank to bank with a channel depth of one foot. The substrate is comprised mainly of silt, sand, cobble, and gravel. The stream flow was low with a flow width of two feet and a depth of one to two inches. The contributing hydrology for this channel is groundwater and surrounding surface water. The only macroinvertebrates observed during the site visit were scuds. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 5. Channel 5 received a total score of 104.

4.2.6 Channel 6 (CH-6)

Channel 6, designated as CH-6, is a natural perennial stream channel that flows southwest into Channel 4 (Photographs 17-18). The approximate location of Channel 6 is shown on Figure 5. It is an unnamed tributary that eventually flows to Streets Run and the Monongahela River. The channel is approximately four feet wide from bank to bank with a channel depth of two feet. The substrate is comprised of silt, sand, gravel, and cobble with vegetation (honeysuckle and grass species) on both sides of the bank. The channel flow was low with of width of three feet and a depth of one inch. This channel was narrow, with eroded slopes and undercut banks with roots present. No macroinvertebrates were observed in the channel at the time of the site visit. The contributing hydrology includes groundwater and surrounding surface waters. Wetland WET-1is located south of this channel on the east side of the channel. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 6. Channel 6 received a total score of 93.

4.2.7 Channel 7 (CH-7)

Channel 7, designated as CH-7, is a natural perennial stream channel located northwest of Channel 6, that flows into Channel 4. (Photographs 19-20). Channel 7 is located adjacent to Channel 6, flowing into Channel 4 with a vegetated area located between the two channels. The approximate location of Stream 7 is shown on Figure 5. It is an unnamed tributary that flows southwest, eventually to Streets Run and the Monongahela River. The channel is approximately four feet wide from bank to bank with a channel depth of two feet. This channel was narrow, with eroded slopes and undercut banks with roots present. The channel flow was low at the time of observation with an approximate flow width of three feet and depth of one inch. The substrate is comprised of silt, sand, gravel, and cobble, and vegetation (honeysuckle and grass species) on both sides of the bank. No macroinvertebrates were observed in the channel. The contributing hydrology was groundwater and surrounding surface waters. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 7. The channel conditions were similar to Channel 6 and was scored similarly and received a total score of 93.

4.2.8 Channel 8 (CH-8)

Channel 8, designated as CH-8, is a natural perennial stream channel located downstream of Channel 7 and flows southwest into Channel 4. (Photographs 21-22). It is an unnamed tributary that eventually flows to Streets Run and the Monongahela River. The approximate location of Channel 8 is shown on Figure 5. The channel was narrow with deep banks, visible erosion, undercuts exposing roots, and fallen vegetation throughout. The channel is approximately six feet wide from bank to bank and with a channel depth of four feet. The channel was flowing at the time of observation with a flow width of six inches and depth of one inch. No macroinvertebrates were observed. The substrate was comprised of silt, sand, gravel, and cobble. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 8. Channel 8 received a total score of 101.

4.2.9 Channel 9 (CH-9)

Channel 9, designated as CH-9, is a man-made OSW channel located in the woods in the northern portion of the east study area of the airport property near runway 10-28 (Photograph 23). The channel begins at a constructed outfall, but the characteristics of the channel show this stream to be stormwater conveyance from the airport runway. This channel continues into a channelized access road and continues along that road, eventually flowing into a constructed wetland area that is part of the South Taylor Environmental Park. The approximate location of Channel 9 is shown on Figure 5. The contributing hydrology for this channel comes from a storm water outfall, Outfall-S (Photograph 24). Channel 9 has a flow direction of northwest with no flow present at the time of observation. The channel depth is approximately two and a half feet and a width of five feet from bank to bank. Both banks were characterized by steep eroded banks with exposed roots. No macroinvertebrates were observed. The substrate is comprised of silt, sand, gravel, cobble, boulder, and bedrock. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 9. Channel 9 received a total score of 68.

4.2.10 Channel 10 (CH-10)

Channel 10, designated as CH-10, is a man-made OSW channel located in the woods north of runway 10-28 and within the northern portion of the north study area of the airport property. (Photograph 25-26). The approximate location of Channel 10 is shown on Figure 6. The channel flow direction runs northeast when flowing and flows into Channel 11. The source of hydrology is from stormwater Outfall-13, located at the most upstream point of the channel. Due to thick vegetation, two sampling reaches were observed for Channel 10, one being upstream and one downstream. Field investigators were able to confirm that the channel flowing into Channel-11 was a continuation of the channel previously designated as Channel 10. The channel was dry at the time of observation. The stream channel was approximately three feet wide from bank to bank with a channel depth of three feet in the upstream sampling reach. The stream channel was approximately four feet wide from bank to bank with a channel depth of two feet in the upstream sampling reach. The substrate consisted mostly of silt, sand, and gravel throughout. Macroinvertebrates were not observed in the substrate. Channel 10 was characterized with having a deeply eroded down hillslope with thick vegetation covering the channel, and rip rap at the start of the channel. A Habitat Assessment Field Data Sheet form was completed for both observed reaches of Channel 10. The upstream reach of Channel 10 received a total score of 99 and the downstream reach of the channel received a total score of 85.

4.2.11 Channel 11 (CH-11)

Channel 11, designated as CH-11, is a man-made OSW channel located in the woods north of runway 10-28 and within the northern portion of the north study area of the airport property (Photographs 27-28). The approximate location of Channel 11 is shown on Figure 6. The channel flow direction runs north when flowing, but flow was not present at the time of the site visit. The source of hydrology is from stormwater and surface runoff. Channel 11 intersects with the east end of Channel 10. Channel 11 is a small channel that begins at the stormwater Outfall K and flows down hillslope with vegetation throughout the channel. The channel was approximately five feet wide from bank to bank with a channel depth of two feet. The substrate consisted mostly of silt, sand, gravel, and cobble. Macroinvertebrates were not observed in the substrate. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 11. Channel 11 received a total score of 86.

4.2.12 Channel 12 (CH-12)

Channel 12, designated as CH-12, is a man-made OSW located north of runway 10-28 and an existing access road (Photographs 29-30). The approximate location of Channel 12 is shown on Figure 7. The channel flow direction runs north when flowing, but flow was not present at the time of the site visit. The source of hydrology appears to come from stormwater and surface runoff. Channel 12 runs parallel with Channel 13. Channel 12 is a manmade drainage channel that begins at a stormwater outfall structure, Outfall 19, off of the access road northeast of runway 10-28. The channel was approximately five feet wide from bank to bank with a channel depth of deep. The substrate consisted of cobble. Macroinvertebrates were not observed in the substrate. Channel 12 was well vegetated and reinforced with rip rap and gabions. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 12. Channel 12 received a total score of 76.

4.2.13 Channel 13 (CH-13)

Channel 13, designated as CH-13, is a man-made OSW channel located in the woods north of runway 10-28 and within the northeastern portion of the east study area of the airport property. (Photographs 31-32). The approximate location of Channel 13 is shown on Figure 7. The channel flow direction runs north downhill when flowing, but flow was not present at the time of the site visit. The source of hydrology appears to come from precipitation and surface runoff. Channel 13 runs virtually parallel with Channel 12. Channel 13 is a manmade drainage channel that starts as a roadside ditch collecting runoff and flows down into the wooded area along the fence line. The channel was approximately three to four feet along the access road and widening to approximately eight feet wide in the wooded area with a depth of four feet throughout. The substrate consisted of silt, sand, cobble, and boulder. Macroinvertebrates were not observed in the substrate. Channel 13 appeared to continue under the fence and outside of the study area. A Habitat Assessment Field Data Sheet form was completed for the observed reach of Channel 13. Channel 13 received a total score of 56.

5.0 SUMMARY OF WETLANDS AND STREAMS IDENTIFED

In total, one wetland was identified within the study area. The general location of the identified wetland is presented on Figure 5. Table 3 below summarizes the identified wetland and presents the wetland type and approximate size of each. Table 4 below summarizes the stream channels identified in the project area.

Table 3
Summary of Wetlands Identified in the Project Area

Sample Point ID	Wetland Name	Wetland Type[1]	Approximate Size of Wetland within the Study Area Boundary (acres)
SP-1	Wetland No. 1	PEM1	0.06

[1]PEM1 = persistent palustrine emergent

Table 4
Summary of Channels Identified in the Project Area

Stream Identification	Stream Chapter 93 Name[1]	Stream Type[2]	Stream Chapter 93 Classification[3]
CH-1	drains to Streets Run	OSW	WWF
CH-2	drains to Streets Run	OSW	WWF
CH-3	UNT to Streets Run	Perennial	WWF
CH-4	UNT to Streets Run	Perennial	WWF
CH-5	UNT to Streets Run	Perennial	WWF
CH-6	UNT to Streets Run	Perennial	WWF
CH-7	UNT to Streets Run	Perennial	WWF
CH-8	UNT to Streets Run	Perennial	WWF
CH-9	drains to Streets Run	OSW	WWF
CH-10	drains to Monongahela River	OSW	WWF
CH-11	drains to Monongahela River	OSW	WWF
CH-12	drains to Monongahela River	OSW	WWF
CH-13	drains to Monongahela River	OSW	WWF

[1]UNT = unnamed tributary
[2]OSW = other surface waters
[3]WWF = warm water fishery

Collective Efforts recommends that Pennsylvania Department of Environmental Protection (PADEP) regulations regarding soil placement, encroachment or disturbance in a wetland, water body or stream be followed. Please note that PADEP regulations state that if wetland impacts are greater than 0.05 acres, a wetland replacement plan in accordance with PADEP's replacement criteria must be provided. All local, state, and federal regulations pertaining to construction in wetlands and streams will apply to construction activities at this site. The conclusions from this wetland delineation are valid for one year. The conclusions may no longer apply if significant land disturbances occur at or near this site.

6.0 REFERENCES

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. January 1987 – Final Report.

Fowler Rhoads, Ann and Block, Timothy A. 2000. *The Plants of Pennsylvania: An Illustrated Manual*. University of Pennsylvania Press. 1061 p.

Munsell Soil Color Charts. 1998. Gretag Macbeth, New Windsor, New York.

Newcomb, Lawrence. 1977. *Newcomb's Wildflower Guide*. Little, Brown and Company, Inc. 490 p.

United States Army Corps of Engineers. April 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region.

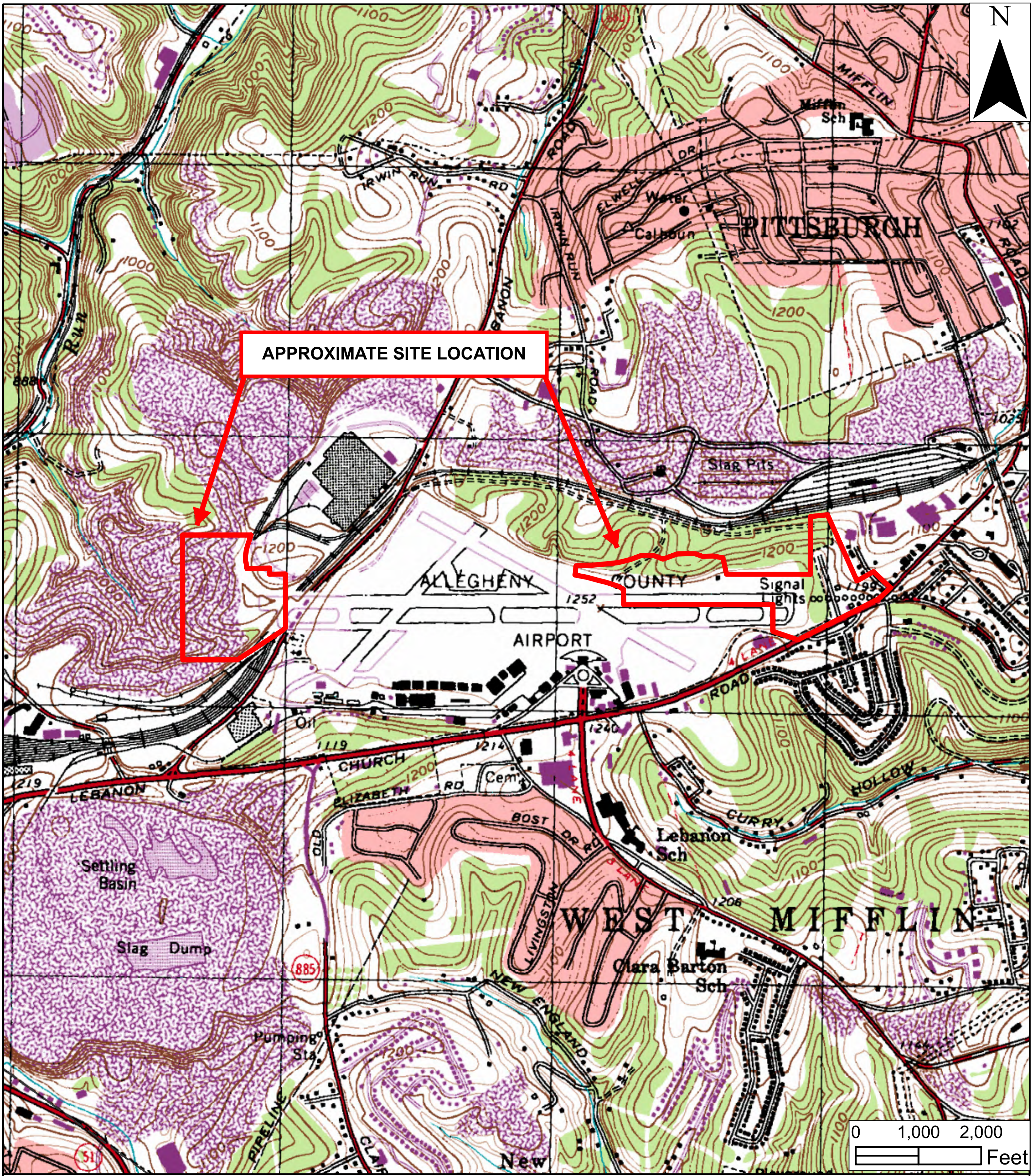
United States Army Corps of Engineers. 2018. National Wetland Plant List, version 3.4, http://wetland_plants.usace.army.mil/.

United States Department of Agriculture, Natural Resources Conservation Service (NRCS). April 2021. Hydric Soils of the United States List and Pennsylvania Hydric Soils List. http://soils.usda.gov/use/hydric/

Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.sc.egov.usda.gov/. Accessed May 19, 2021.

United States Department of Agriculture, Soil Conservation Service. August 1981. Soil Survey of Allegheny County, Pennsylvania.

FIGURES



Map Sources: USGS Glassport PA Quadrangle - Scale: 1 "=2,000 '

Collective Efforts, LLC

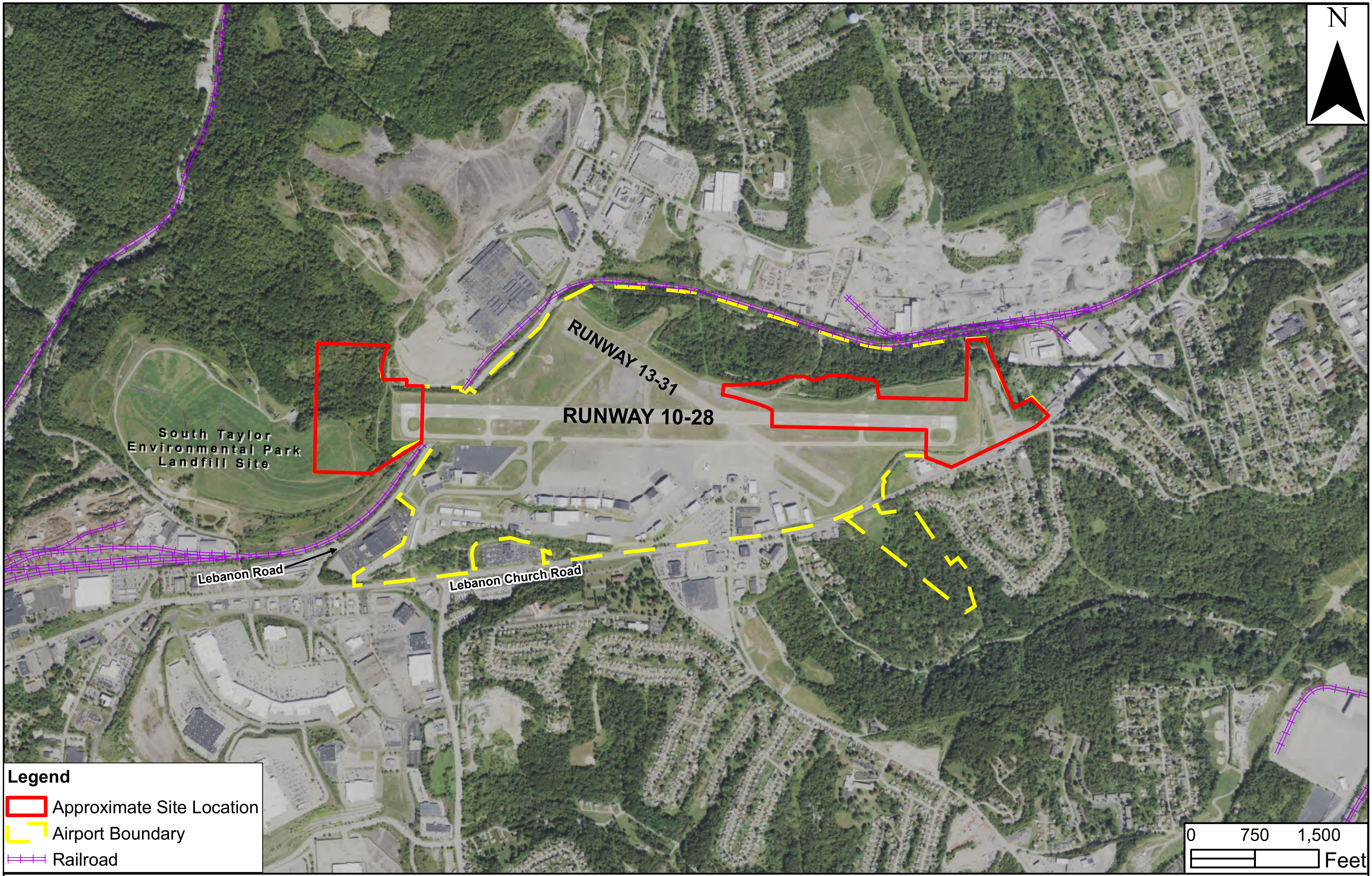
Civil and Environmental Engineers

USGS Location Map

Wetland Delineation and Stream Identification Report

Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 1



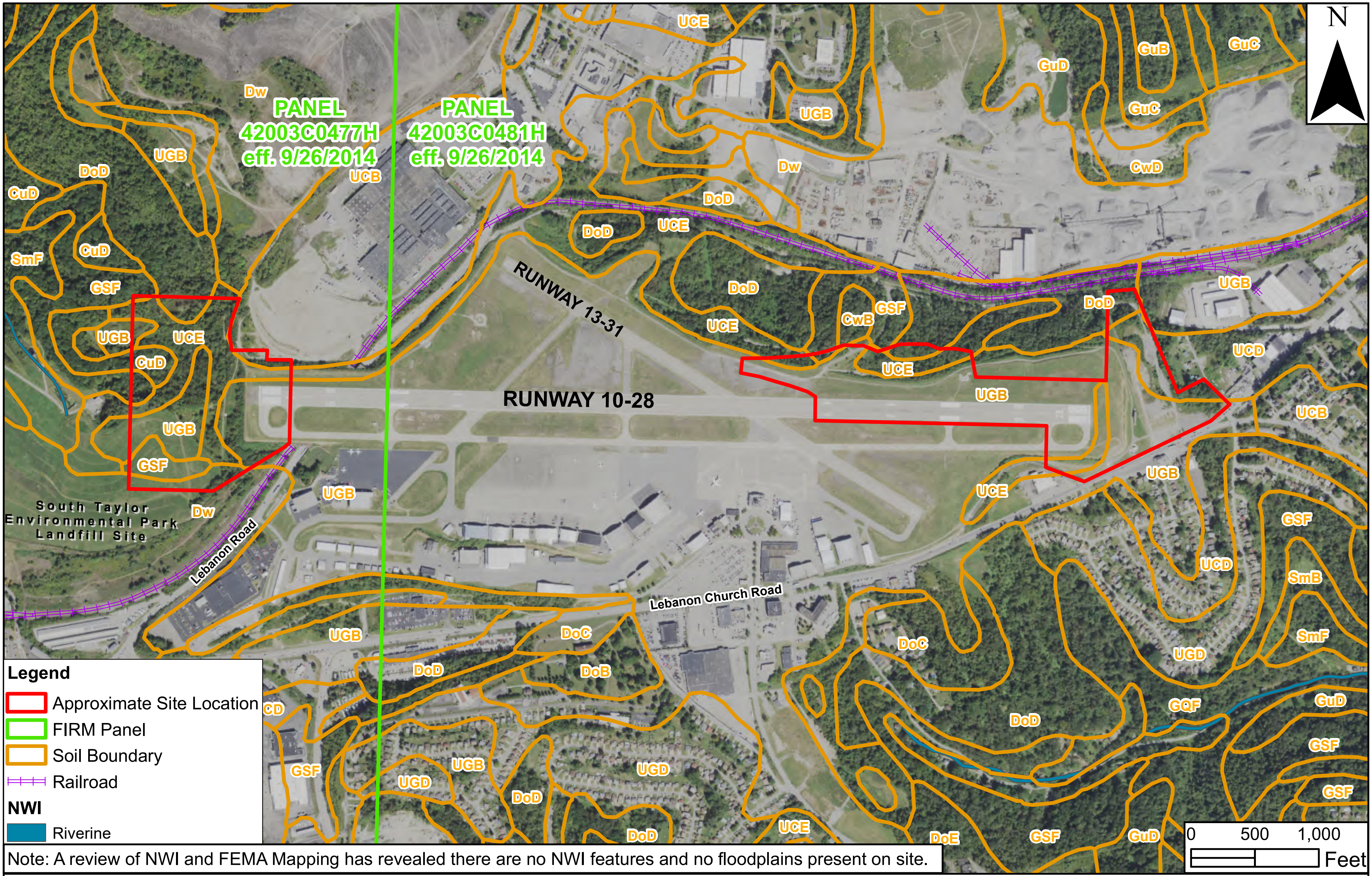
Map Sources: PASDA Statewide Color 2019 Imagery - Scale: 1 "=1,500 '

Collective Efforts, LLC

Civil and Environmental Engineers

General Site Vicinity Map
Wetland Delineation and Stream Identification Report
Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 2



Note: A review of NWI and FEMA Mapping has revealed there are no NWI features and no floodplains present on site.

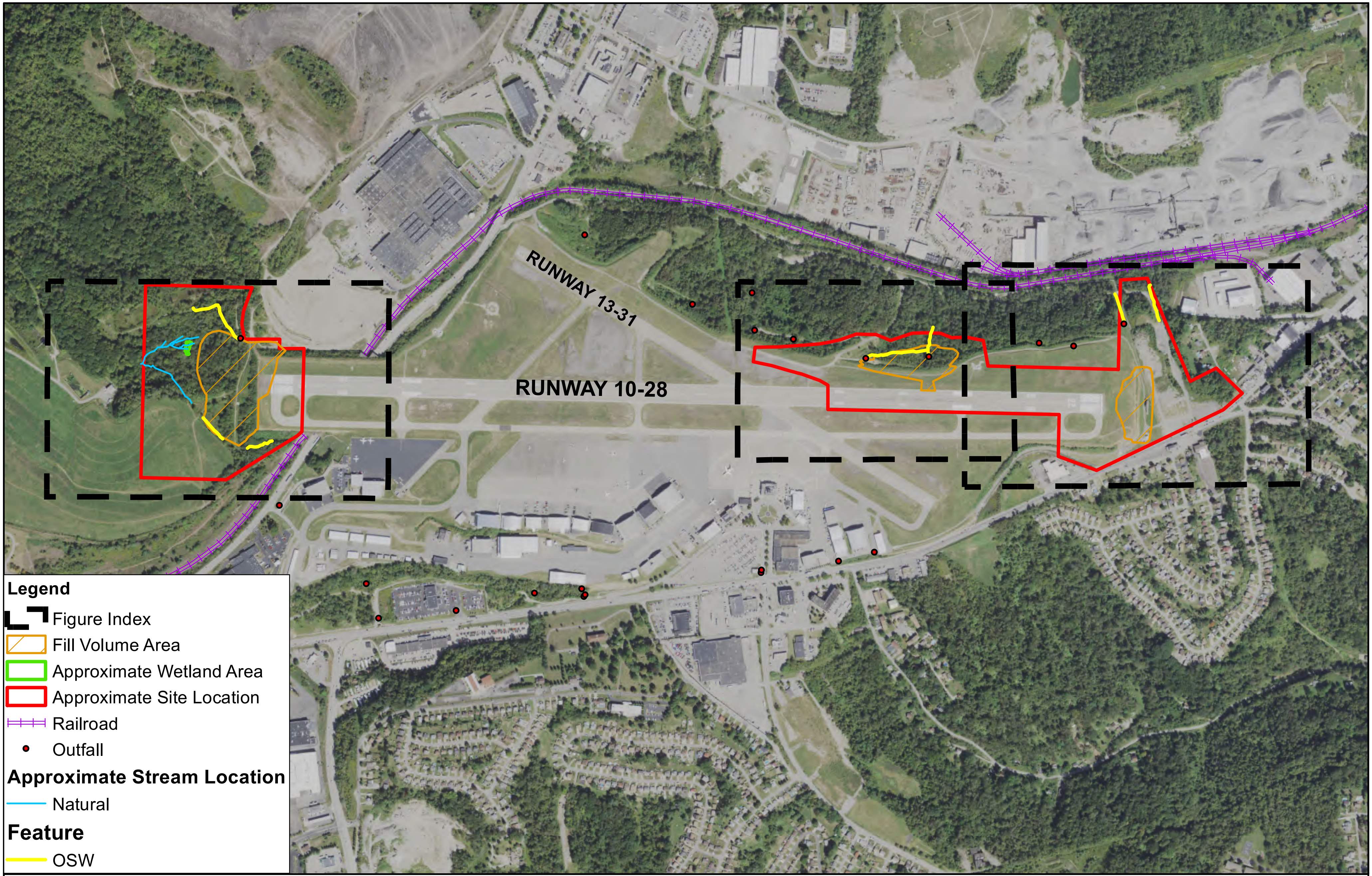
Map Sources: USDA Web Soil Survey, USFWS NWI, FEMA NFHL, PASDA Statewide Color 2019 Imagery - Scale: 1 "=1,000 '

Collective Efforts, LLC

Civil and Environmental Engineers

Soils, NWI, Floodplain Map
Wetland Delineation and Stream Identification Report
Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 3



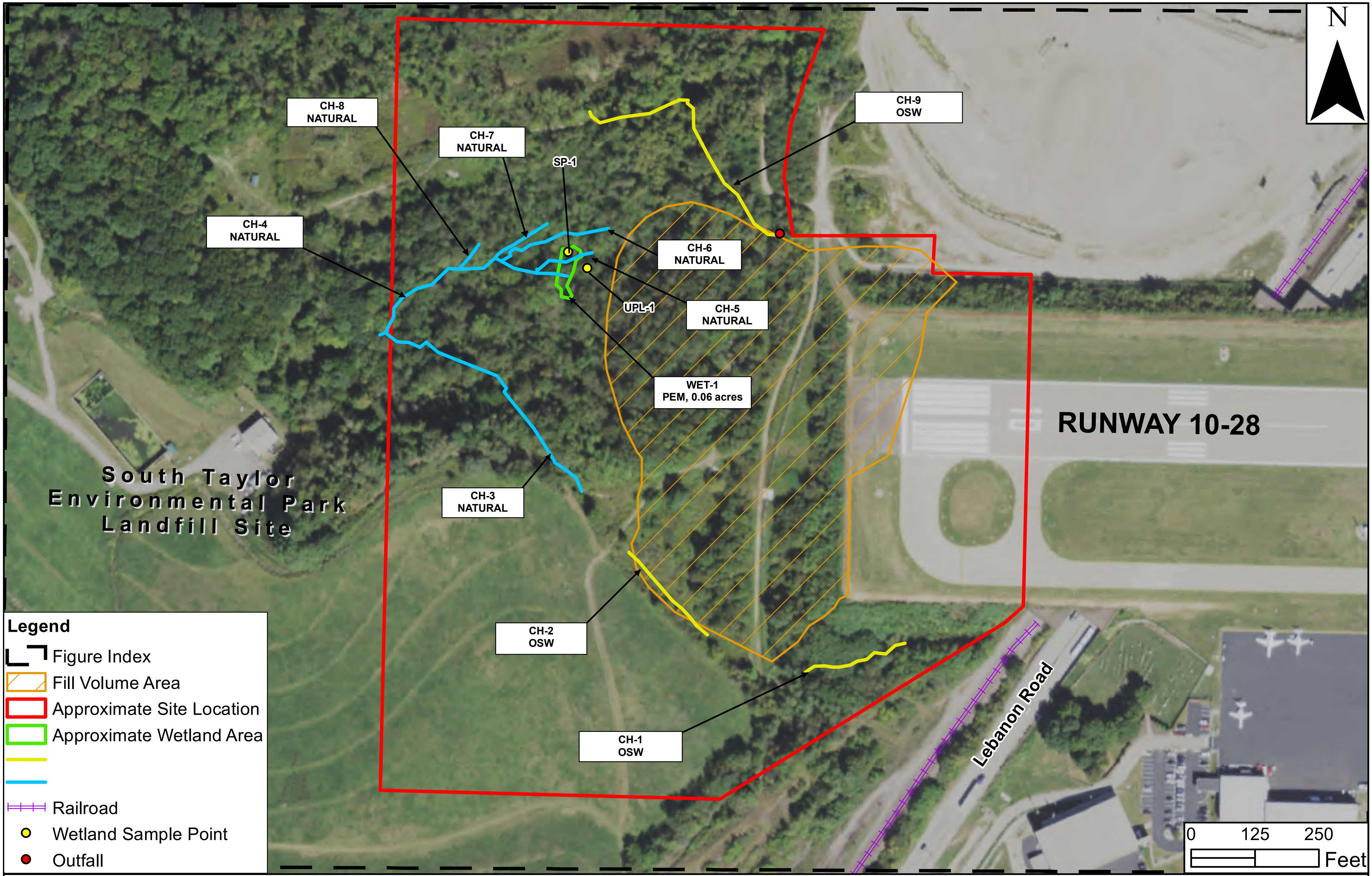
Map Sources: PASDA Statewide Color 2019 Imagery - Scale: 1 "=1,000 '

Collective Efforts, LLC

Civil and Environmental Engineers

Overall Wetland and Stream Location Map
Wetland Delineation and Stream Identification Report
Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 4



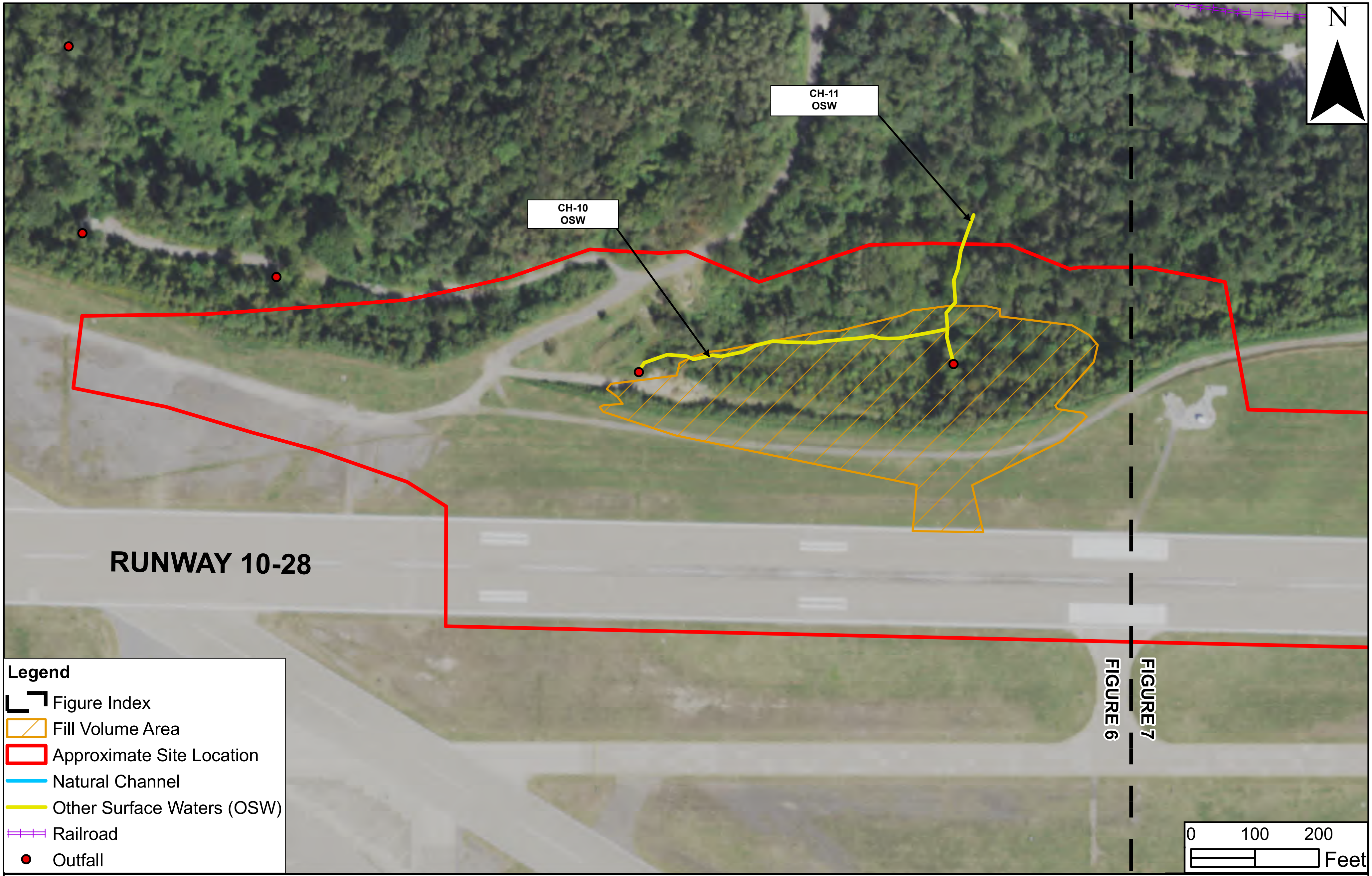
Map Sources: PASDA Statewide Color 2019 Imagery - Scale:1 "=250 '

Collective Efforts, LLC

Civil and Environmental Engineers

Field Observations: East Study Area
Wetland Delineation and Stream Identification Report
Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 5



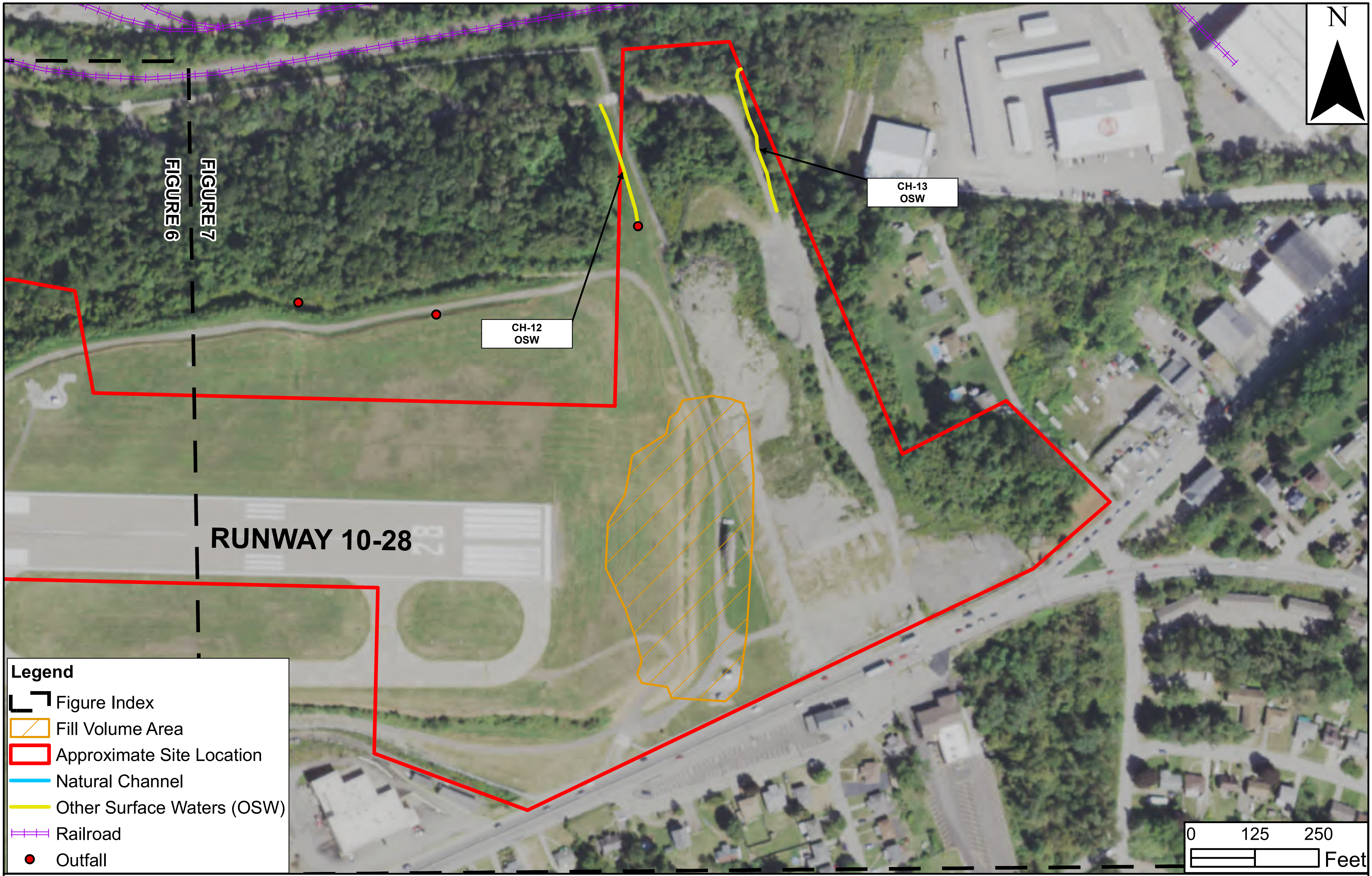
Map Sources: PASDA Statewide Color 2019 Imagery - Scale:1 "=200 '

Collective Efforts, LLC

Civil and Environmental Engineers

Field Observations: North Study Area
Wetland Delineation and Stream Identification Report
Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 6



Map Sources: PASDA Statewide Color 2019 Imagery - Scale:1 "=250 '

Collective Efforts, LLC

Civil and Environmental Engineers

Field Observations: East Study Area
Wetland Delineation and Stream Identification Report
Allegheny County Airport Property

Drawn By: RLG	Chkd By: CMC	Date: November 2021 Project No.19-33-104	Figure 7

APPENDICES

APPENDIX A - FEMA FIRM PANELS

79°56'15.44"W 40°22'36.62"N

79°54'22.08"W 40°20'30.94"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	🟦	Without Base Flood Elevation (BFE) *Zone A, V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR*
	▨	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	🟧	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	▨	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	▨	Area with Reduced Flood Risk due to Levee See Notes *Zone X*
	▨	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
	☐	Effective LOMRs
	🟧	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	- - - - -	Channel, Culvert, or Storm Sewer
	ı ı ı ı ı ı ı	Levee, Dike, or Floodwall
OTHER FEATURES	(B) 20.2	Cross Sections with 1% Annual Chance
	17.5	Water Surface Elevation
	(8) - - -	Coastal Transect
	-·- -·-	Coastal Transect Baseline
	— - - —	Profile Baseline
	——	Hydrographic Feature
	~~ 513 ~~	Base Flood Elevation Line (BFE)
	——	Limit of Study
	——	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **1/13/2022 12:15 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

▲ N

1 inch = 500 feet **1:6,000**

0 250 500 1,000 1,500 2,000 Feet

Meters 0 50 100 200 300 400

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

PANEL **481** OF **556**

Panel Contains:

COMMUNITY	NUMBER	PANEL
BOROUGH OF WEST MIFFLIN	420085	0481
CITY OF PITTSBURGH	420063	0481

MAP NUMBER
42003C0481H
EFFECTIVE DATE
September 26, 2014

79°58'7.94"W 40°22'36.62"N

79°56'14.58"W 40°20'30.94"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP
FOR DRAFT FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	🟦	Without Base Flood Elevation (BFE) *Zone A, V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR*
	▨	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	🟧	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	▨	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	▨	Area with Reduced Flood Risk due to Levee See Notes *Zone X*
	▨	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
	☐	Effective LOMRs
	🟧	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	- — - — - — -	Channel, Culvert, or Storm Sewer
	ı ı ı ı ı ı ı ı ı ı	Levee, Dike, or Floodwall
OTHER FEATURES	(B) —— 20.2	Cross Sections with 1% Annual Chance
	—— 17.5	Water Surface Elevation
	(8) - - - -	Coastal Transect
	--— --— --—	Coastal Transect Baseline
	— - - —	Profile Baseline
	——	Hydrographic Feature
	～～ 513 ～～	Base Flood Elevation Line (BFE)
	═══	Limit of Study
	——	Jurisdiction Boundary

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This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **1/13/2022 12:13 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

▲
N

1 inch = 500 feet **1:6,000**

0 250 500 1,000 1,500 2,000 Feet

Meters 0 50 100 200 300 400

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

PANEL **477** OF **556**

Panel Contains:

COMMUNITY	NUMBER	PANEL
BOROUGH OF WEST MIFFLIN	420085	0477
BOROUGH OF BRENTWOOD	420017	0477
BOROUGH OF PLEASANT HILLS	420064	0477
BOROUGH OF BALDWIN	420007	0477
BOROUGH OF WHITEHALL	420088	0477
CITY OF PITTSBURGH	420063	0477

MAP NUMBER
42003C0477H
EFFECTIVE DATE
September 26, 2014

APPENDIX B - PHOTOGRAPHS

Wetland Delineation and Stream Identification Photographs

1) 05/21/2021: AGC Airfield west of runway 10, facing south west looking at Wetland 1.

2) 05/21/2021: AGC Airfield west of runway 10, facing east looking at Wetland 1.

3) 05/21/2021: AGC Airfield west of runway 10, facing south looking at Wetland 1.

4) 05/21/2021: AGC Airfield west of runway 10, facing north Looking at the edge of Wetland 1. Ground was saturated and contained shallow stagnant pools.

Wetland Delineation and Stream Identification Photographs

5) 05/20/2021: AGC Airport west of runway 10, facing north east and upstream in Channel 1.

6) 05/20/2021: AGC Airport west of runway 10, facing south west and downstream in Channel 1.

7) 05/20/2021: AGC Airport west of runway 10, facing southeast and upstream in Channel 2.

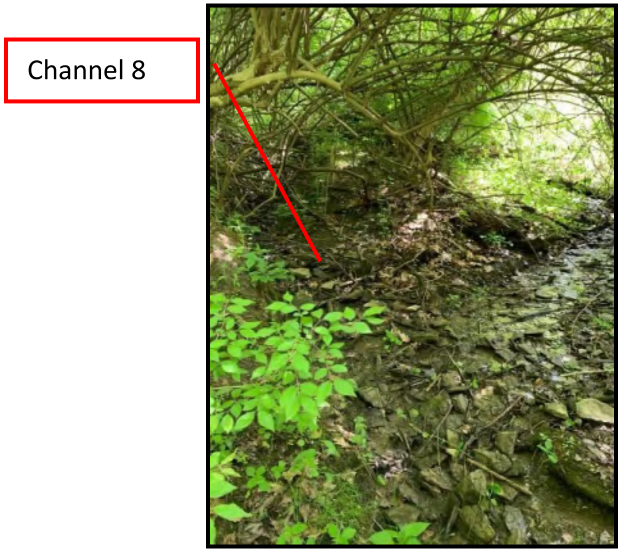
Geo lining in channel bed

8) 05/20/2021: AGC Airport west of runway 10, looking at the geo lining along the bed in Channel 2.

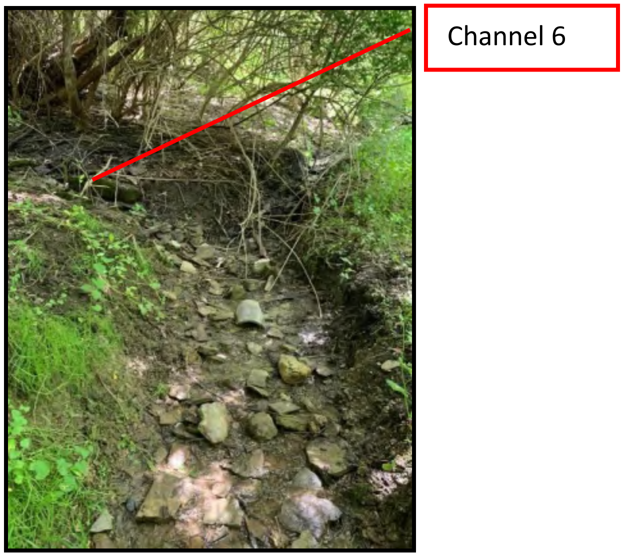
9) 05/20/2021: AGC Airport west of runway 10, facing west and downstream in Channel 3.

10) 05/20/2021: AGC Airport west of runway 10, facing east and upstream in Channel 3.

11) 05/20/2021: AGC Airport west of runway 10, facing northwest and upstream in Channel 4.



12) 05/20/2021: AGC Airport west of runway 10, facing north and upstream in Channel 4. Tributary to Channel 8 on the right bank.



13) 05/20/2021: AGC Airport west of runway 10, facing north and upstream in Channel 4. Channel 6 intersects off the left bank.

14) 05/20/2021: AGC Airport west of runway 10, facing south and down stream, where channel 4 begins. Channel 4 seems to flow from a groundwater seep.

15) 05/20/2021: AGC Airport west of runway 10, facing west and upstream in Channel 5.

16) 05/20/2021: AGC Airport west of runway 10, facing southwest and downstream in channel 5. Channel 5 flows through Wetland-1.

Wetland Delineation and Stream Identification Photographs

17) 05/20/2021: AGC Airport west of runway 10, facing north east and upstream in Channel 6. Ground was saturated but there was no flowing water.

18) 05/20/2021: AGC Airport west of runway 10, facing south west and downstream in Channel 6. Ground contained puddles of stagnant water towards upstream end.

19) 05/20/2021: AGC Airfield west of runway 10, facing south west and downstream in Channel 7.

20) 05/20/2021: AGC Airfield west of runway 10, facing north east and upstream in Channel 7

Wetland Delineation and Stream Identification Photographs

21) 05/20/2021: AGC Airfield west of runway 10, facing north east and upstream in Channel 8.

22) 05/20/2021: AGC Airfield west of runway 10, facing northeast and upstream in Channel 8.

23) 05/25/2021: AGC Airfield west of runway 10, facing north and downstream in Channel 9.

24) 05/25/2021: AGC Airfield west of runway 10, facing south at the outfall upstream of Channel 9.

Wetland Delineation and Stream Identification Photographs

25) 05/25/2021: AGC Airfield north of runway 28, facing east and downstream in Channel 10. Channel 10 begins at Outfall 13.

26) 05/25/2021: AGC Airfield north of runway 28, facing west and upstream in Channel 10. Channel 10 did not contain flowing water.

27) 05/25/2021: AGC Airfield nth of runway 28, facing north and downstream in Channel 11.

28) 05/25/2021: AGC Airfield north of runway 28, facing south and upstream in Channel 11.

29) 05/25/2021: AGC Airfield east of runway 28, facing north and downstream of Channel 12

30) 05/25/2021: AGC Airfied east of runway 28, facing south and upstream of Channel 12. Channel 12 begins at Outfall 19.

31) 05/25/2021: AGC Airfield east of runway 28, facing south and upstream of Channel 13.

32) 05/25/2021: AGC Airfield east of runway 28, facing north and downstream of Channel 13.

APPENDIX C – WETLAND DELINEATION DATA SHEETS

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Allegheny County Airport (AGC) City/County: West Mifflin, Allegheny Sampling Date: 05/21/2021

Applicant/Owner: ACAA State: PA Sampling Point: SP-1

Investigator(s): Brianna Shea, Rachel Galloway Section, Township, Range: West Mifflin Township

Landform (hillslope, terrace, etc.): Hill slope Local relief (concave, convex, none): concave Slope (%): 0%

Subregion (LRR or MLRA): LRRN Lat: 40.355126 Long: -79.943471 Datum: NAD83

Soil Map Unit Name: UCE - Urban land-Culleoka complex, steep NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes x No____

Hydric Soil Present? Yes X No____

Wetland Hydrology Present? Yes X No____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:

The wetland is located between Channels 4 and 5 on the downhill slope west of Runway 10/28. heavily vegetated with patches of saturated soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

☐ Surface Water (A1)
☑ High Water Table (A2)
☑ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)
☐ Aquatic Fauna (B13)
☐ True Aquatic Plants (B14)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Drainage Patterns (B10)
☐ Moss Trim Lines (B16)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Stunted or Stressed Plants (D1)
☑ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No x Depth (inches): ____

Water Table Present? Yes x No ____ Depth (inches): 8-10

Saturation Present? (includes capillary fringe) Yes x No ____ Depth (inches): 0

Wetland Hydrology Present? Yes x **No**____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

channels 4 and 5 flow through the wetland. The banks of these channels are low at these areas creating patches of saturation throughout the wetland. Water from the channels seems to be from a groundwater seepage.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. None observed			
2.			
3.			
4.			
5.			
6.			
7.			
	____ = Total Cover		

50% of total cover: ____ 20% of total cover: ____

Sapling/Shrub Stratum (Plot size: 15)			
1. *Lonicera japonica*	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 1

Herb Stratum (Plot size: 5)			
1. *Solidago gigantea*	45	Y	FACW
2. *Carex stipata*	15	Y	OBL
3. *Carex vulpenoidia*	15	Y	OBL
4. *Equisetum arvense*	10	N	FAC
5. *Impatiens capensis*	10	N	FACW
6. *Eupatorium perfoliatum*	5	N	FACW
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 15)			
1. None Observed			
2.			
3.			
4.			
5.			
	____ = Total Cover		

50% of total cover: ____ 20% of total cover: ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 2/1	90	7.5 YR 3/3	10			Silty Clay	Saturated
4-10	10 YR 3/1	95	7.5 YR 3/4	5			Silty Clay	Saturated
10-18	Gley 1 4/N	100	--				Silty Clay	Saturated

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☑ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ______

Remarks:
Soil was completely saturated, no restrictive layer

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Allegheny County Airport (AGC) City/County: West Mifflin, Allegheny Sampling Date: 05/21/2021

Applicant/Owner: ACAA State: PA Sampling Point: SP-1

Investigator(s): Brianna Shea, Rachel Galloway Section, Township, Range: West Mifflin Township

Landform (hillslope, terrace, etc.): Hill slope Local relief (concave, convex, none): concave Slope (%): 0%

Subregion (LRR or MLRA): LRRN Lat: 40.355126 Long: -79.943471 Datum: NAD83

Soil Map Unit Name: UCE - Urban land-Culleoka complex, steep NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes x No ____

Hydric Soil Present? Yes x No ____

Wetland Hydrology Present? Yes x No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:

The wetland is located between Channels 4 and 5 on the downhill slope west of Runway 10/28. heavily vegetated with patches of saturated soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

☐ Surface Water (A1)
☑ High Water Table (A2)
☑ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)
☐ Aquatic Fauna (B13)
☐ True Aquatic Plants (B14)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Drainage Patterns (B10)
☐ Moss Trim Lines (B16)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Stunted or Stressed Plants (D1)
☑ Geomorphic Position (D2)
☐ Shallow Aquitard (D3)
☐ Microtopographic Relief (D4)
☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No x Depth (inches): ____

Water Table Present? Yes x No ____ Depth (inches): 8-10

Saturation Present? (includes capillary fringe) Yes x No ____ Depth (inches): 0

Wetland Hydrology Present? Yes x **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

channels 4 and 5 flow through the wetland. The banks of these channels are low at these areas creating patches of saturation throughout the wetland. Water from the channels seems to be from a groundwater seepage.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. None observed			
2.			
3.			
4.			
5.			
6.			
7.			

= Total Cover

50% of total cover: 20% of total cover:

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lonicera japonica*	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

5 = Total Cover

50% of total cover: 2.5 20% of total cover: 1

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Solidago gigantea*	45	Y	FACW
2. *Carex stipata*	15	Y	OBL
3. *Carex vulpenoidia*	15	Y	OBL
4. *Equisetum arvense*	10	N	FAC
5. *Impatiens capensis*	10	N	FACW
6. *Eurpatorium perfoliatum*	5	N	FACW
7.			
8.			
9.			
10.			
11.			

100 = Total Cover

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. None Observed			
2.			
3.			
4.			
5.			

= Total Cover

50% of total cover: 20% of total cover:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 2/1	90	7.5 YR 3/3	10			Silty Clay	Saturated
4-10	10 YR 3/1	95	7.5 YR 3/4	5			Silty Clay	Saturated
10-18	Gley 1 4/N	100	--				Silty Clay	Saturated

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) **(LRR N)**
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
☑ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☑ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
☐ Umbric Surface (F13) **(MLRA 136, 122)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

☐ 2 cm Muck (A10) **(MLRA 147)**
☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ______

Remarks:
Soil was completely saturated, no restrictive layer

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Allegheny County Airport City/County: Allegheny Sampling Date: 05/21/2021

Applicant/Owner: ACAA State: PA Sampling Point: UPL-1

Investigator(s): Brianna Shea, Rachel Galloway Section, Township, Range: West Mifflin Township

Landform (hillslope, terrace, etc.): Hill slope Local relief (concave, convex, none): Concave Slope (%): 8%

Subregion (LRR or MLRA): LRRN Lat: 40.355041 Long: -79.943335 Datum: NAD83

Soil Map Unit Name: UCE - Urban land-Culleoka complex, steep NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are “Normal Circumstances” present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X

Hydric Soil Present? Yes ____ No X

Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:

Located between two channels (channels 4 and 5) on hill slope with minimal to no herbaceous vegetation present, mostly bare ground understory with detritus

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: UPL-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lonicera japonica*	60	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	60 = Total Cover		

50% of total cover: ____ 20% of total cover: ____

Sapling/Shrub Stratum (Plot size: 15)			
1. *Lonicera japonica*	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	15 = Total Cover		

50% of total cover: ____ 20% of total cover: ____

Herb Stratum (Plot size: 5)			
1. None Observed			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

50% of total cover: ____ 20% of total cover: ____

Woody Vine Stratum (Plot size: 15)			
1. None Observed			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: ____ 20% of total cover: ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	75	x 4 =	300
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

Bare ground shaded by dense honey suckle cover

SOIL

Sampling Point: UPL-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					silty, dry	crumbly, no rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) **(LRR N)**
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
☐ Umbric Surface (F13) **(MLRA 136, 122)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

☐ 2 cm Muck (A10) **(MLRA 147)**
☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: detritus, organic material
Depth (inches): 4 inches

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
Restrictive layer at 4 inches, not rock, just organic material

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Allegheny County Airport City/County: Allegheny Sampling Date: 05/21/2021
Applicant/Owner: ACAA State: PA Sampling Point: UPL-1
Investigator(s): Brianna Shea, Rachel Galloway Section, Township, Range: West Mifflin Township
Landform (hillslope, terrace, etc.): Hill slope Local relief (concave, convex, none): Concave Slope (%): 8%
Subregion (LRR or MLRA): LRRN Lat: 40.355041 Long: -79.943335 Datum: NAD83
Soil Map Unit Name: UCE - Urban land-Culleoka complex, steep NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)
Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are “Normal Circumstances” present? Yes X No ______
Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No X	Is the Sampled Area within a Wetland?	Yes ______	No X
Hydric Soil Present?	Yes ______	No X			
Wetland Hydrology Present?	Yes ______	No X			

Remarks:

Located between two channels (channels 4 and 5) on hill slope with minimal to no herbaceous vegetation present, mostly bare ground understory with detritus

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ______	No X	Depth (inches): ________
Water Table Present?	Yes ______	No X	Depth (inches): ________
Saturation Present? (includes capillary fringe)	Yes ______	No X	Depth (inches): ________

Wetland Hydrology Present? **Yes** ______ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lonicera japonica*	60	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	60 = Total Cover		

50% of total cover: 20% of total cover:

Sapling/Shrub Stratum (Plot size: 15)			
1. *Lonicera japonica*	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	15 = Total Cover		

50% of total cover: 20% of total cover:

Herb Stratum (Plot size: 5)			
1. None Observed			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

50% of total cover: 20% of total cover:

Woody Vine Stratum (Plot size: 15)			
1. None Observed			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: 20% of total cover:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	75	x 4 = 300
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

Bare ground shaded by dense honey suckle cover

SOIL

Sampling Point: UPL-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					silty, dry	crumbly, no rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: detritus, organic material

Depth (inches): 4 inches

Hydric Soil Present? **Yes** ______ **No** X

Remarks:
Restrictive layer at 4 inches, not rock, just organic material

APPENDIX D – STREAM IDENTIFICATION DATA SHEETS

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -1*
LOCATION South of runway 10-28
STATION #________ RIVERMILE________
STREAM CLASS Stormwater outfall
LAT 40.3528 LONG -79.9417
RIVER BASIN Streets Run - Monongahela
STORET #
AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway
FORM COMPLETED BY R. Galloway, B. Shea
DATE 05/20/21
TIME 8:12 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____% ☐	%cloud cover	☐ ____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17° C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel 1 begins at a culvert and conveys storm water from the runway.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-1

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☒ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☐ Grasses ☒ Herbaceous

dominant species present tree of heaven, garlic mustard, honeysuckle

INSTREAM FEATURES

No flowing water present

Estimated Reach Length 65.2 m

Estimated Stream Width 1.5 m

Sampling Reach Area _______m^2

Area in km^2 (m^2x1000) _______km^2

Estimated Stream Depth N/A m

Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☐ Pool_______%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2

Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present ____

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature N/A ^{0} C

Specific Conductance N/A

Dissolved Oxygen N/A

pH N/A

Turbidity N/A

WQ Instrument Used N/A

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other___________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_______________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**
Bedrock		0
Boulder	> 256 mm (10")	0
Cobble	64-256 mm (2.5"-10")	15
Gravel	2-64 mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	30
Silt	0.004-0.06 mm	15
Clay	< 0.004 mm (slick)	0

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Characteristic**	**% Composition in Sampling Area**
Detritus	sticks, wood, coarse plant materials (CPOM)	Debris left from runoff
Muck-Mud	black, very fine organic (FPOM)	0
Marl	grey, shell fragments	0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel -1	LOCATION South of runway 10-28	
STATION #_________ RIVERMILE_________	STREAM CLASS Stormwater outfall	
LAT 40.3528 LONG -79.9417	RIVER BASIN Streets Run - Monongahela	
STORET #	AGENCY Collective Efforts	
INVESTIGATORS D. Costantini, B. Shea, R. Galloway		
FORM COMPLETED BY R. Galloway, B. Shea	DATE 05/20/21 TIME 8:12 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	**Condition Category**			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 17	20 19 18 [✓ 17] 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 4 (LB)	Left Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 [✓ 4] 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0

Total Score 79

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Channel -2	LOCATION South of runway 10-28 AGC
STATION #________ RIVERMILE________	STREAM CLASS Man Made
LAT 40.3528 LONG -79.9417	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	

FORM COMPLETED BY B. Shea	DATE 05/20/21 TIME 9:05 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS	**Now**		**Past 24 hours**	**Has there been a heavy rain in the last 7 days?** ☐ Yes ☒ No
	☐	storm (heavy rain)	☐	**Air Temperature** 17° C
	☐	rain (steady rain)	☐	**Other**________________
	☐	showers (intermittent)	☐	
	____%☐	%cloud cover	☐____%	
	☒	clear/sunny	☐	

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Stream bed is lined with a geo liner and is shallow.
A 24 inch culvert is located at the end of the stream channel.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-2

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☐ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☒ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☒ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☒ Herbaceous

dominant species present Goldenrod, honeysuckle, Aster sp.

INSTREAM FEATURES

No flowing water present

Estimated Reach Length 68 m

Estimated Stream Width 0.3 m

Sampling Reach Area _______ m^2

Area in km^2 (m^{2}x1000) _______ km^2

Estimated Stream Depth N/A m

Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☒ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark _______ m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☐ Pool_______%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _N/A_____ m^2

Density of LWD __N/A____ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present ____

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature N/A ^{0} C

Specific Conductance N/A

Dissolved Oxygen N/A

pH N/A

Turbidity N/A

WQ Instrument Used N/A

Water Odors
☐ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☐ None ☐ Other_____________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other____________N/A_________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☒ Other_________N/A_________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	Geo lining along stream bed
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	5	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	30	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	15			
Clay	< 0.004 mm (slick)	30			

HABITAT ASSESSMENT FIELD DATA SHEET - LOW GRADIENT STREAMS

STREAM NAME Channel -2	LOCATION South of runway 10-28 AGC	
STATION #______ RIVERMILE_________	STREAM CLASS Man made	
LAT 40.3528 LONG -79.9417	RIVER BASIN Streets Run - Monongahela	
STORET #	AGENCY Collective Efforts	
INVESTIGATORS D. Costantini, B. Shea, R. Galloway		
FORM COMPLETED BY R. Galloway, B. Shea	DATE 05/20/21 TIME 9:05 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover** No flowing water present	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status No flowing water present	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	**Condition Category**			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0

Total Score 71

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Channel -3	LOCATION South of runway 10-28 AGC
STATION #________ RIVERMILE________	STREAM CLASS Perennial
LAT 40.353880 LONG -79.943342	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/20/21 TIME 9:40 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation	

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17⁰ C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Perennial, intermittent and ephemeral designations were based upon observed water flow at the time of the site visit. No other criteria were used for this designation.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-3

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Groundwater/surface water runoff

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☒ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☒ Herbaceous
dominant species present Sugar maples, garlic mustard

INSTREAM FEATURES

Estimated Reach Length 174 m
Estimated Stream Width 1.6 m
Sampling Reach Area _______m^2
Area in km^2 (m^2x1000) _______km^2
Estimated Stream Depth .6 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☒ Shaded
High Water Mark _______m
Proportion of Reach Represented by Stream Morphology Types
☒ Riffle 35 % ☐ Run_______%
☒ Pool 65 %
Channelized ☒ Yes ☐ No
Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2
Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☒ Attached Algae
dominant species present Algae growing in the surface of rocks
Portion of the reach with aquatic vegetation 3 %

WATER QUALITY

Temperature 12.7 °C
Specific Conductance 819 uS/cm
Dissolved Oxygen N/A
pH 8.61
Turbidity N/A
WQ Instrument Used Oakton Pocket Tester

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other_________________________

Turbidity (if not measured)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☒ Other N/A

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		25	Detritus	sticks, wood, coarse plant materials (CPOM)	80%
Boulder	> 256 mm (10")	15			
Cobble	64-256 mm (2.5"-10")	25	Muck-Mud	black, very fine organic (FPOM)	0%
Gravel	2-64 mm (0.1"-2.5")	25			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0%
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	5			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel - 3

LOCATION South of runway 10-28 AGC

STATION #_________ RIVERMILE_________

STREAM CLASS Perennial

LAT 40.353880 LONG -79.943342

RIVER BASIN Streets Run - Monongahela

STORET #

AGENCY Collective Efforts

INVESTIGATORS D. Costantini, B. Shea, R. Galloway

FORM COMPLETED BY R. Galloway, B. Shea

DATE 05/20/21
TIME 9:40 [✓ AM] PM

REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

		Condition Category			
	Habitat Parameter	**Optimal**	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime Very Shallow	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 [✓ 2] 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 [✓ 2] 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	**Condition Category**			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 85

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -4*

LOCATION West of runway 10-28 AGC

STATION #________ RIVERMILE________

STREAM CLASS Perennial

LAT 40.355078 LONG -79.944265

RIVER BASIN Streets Run - Monongahela

STORET #

AGENCY Collective Efforts

INVESTIGATORS D. Costantini, B. Shea, R. Galloway

FORM COMPLETED BY B. Shea

DATE 05/20/21
TIME 11:15 [✓ AM] PM

REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		**Past 24 hours**
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17° C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Perennial, intermittent and ephemeral designations were based upon observed water flow at the time of the site visit. No other criteria were used for this designation.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-4

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Groundwater/ Surface water Runoff

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	**Predominant Surrounding Landuse** ☒ Forest ☐ Field/Pasture ☐ Agricultural ☐ Residential ☐ Commercial ☒ Industrial ☐ Other _______________ **Local Watershed NPS Pollution** ☐ No evidence ☒ Some potential sources ☐ Obvious sources **Local Watershed Erosion** ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	**Indicate the dominant type and record the dominant species present** ☒ Trees ☒ Shrubs ☐ Grasses ☒ Herbaceous **dominant species present** Sugar maples, garlic mustard, honeysuckle
INSTREAM FEATURES	**Estimated Reach Length** 143.5m **Estimated Stream Width** 3.05m **Sampling Reach Area** _______m^2 **Area in km^2 (m^{2}x1000)** _______km^2 **Estimated Stream Depth** .5 -1.5m **Surface Velocity (at thalweg)** ____N/A___m/sec **Canopy Cover** ☐ Partly open ☐ Partly shaded ☒ Shaded **High Water Mark** _______m **Proportion of Reach Represented by Stream Morphology Types** ☒ Riffle 65 % ☒ Run 35 % ☐ Pool_______% **Channelized** ☐ Yes ☒ No **Dam Present** ☐ Yes ☒ No
LARGE WOODY DEBRIS	**LWD** _______m^2 **Density of LWD** _______m^2/km^2 **(LWD/ reach area)**
AQUATIC VEGETATION	**Indicate the dominant type and record the dominant species present** ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae **dominant species present** N/A **Portion of the reach with aquatic vegetation** _____%
WATER QUALITY	**Temperature** 14.2 ⁰ C **Specific Conductance** 890 uS/cm **Dissolved Oxygen** N/A **pH** 8.75 **Turbidity** N/A **WQ Instrument Used** Oakton **Water Odors** ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other________________ **Water Surface Oils** ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☒ None ☐ Other________________________ **Turbidity (if not measured)** ☐ Clear ☒ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other________
SEDIMENT/ SUBSTRATE	**Odors** ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☒ None ☐ Other__________________________________ **Oils** ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse **Deposits** ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other________________ **Looking at stones which are not deeply embedded, are the undersides black in color?** ☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		40	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	15			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	15			
Clay	< 0.004 mm (slick)	30			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel -4
LOCATION West of runway 10-28 AGC
STATION #_________ RIVERMILE_________
STREAM CLASS Perennial
LAT 40.355078 LONG -79.944265
RIVER BASIN Streets Run - Monongahela
STORET #
AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway
FORM COMPLETED BY B. Shea
DATE 05/20/21
TIME 11:15 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
	3. Velocity/Depth Regime fast flowing, Shallow	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 16	20 19 18 17 [✓ 16]	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated broader than sampling reach	**6. Channel Alteration**	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
	SCORE 16	20 19 18 17 [✓ 16]	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE 5 (LB)	Left Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
	SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
	SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
	SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0

Total Score 110

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)

STREAM NAME *Channel -5*	LOCATION South of runway 10-28 AGC
STATION #________ RIVERMILE________	STREAM CLASS Perennial
LAT 40.355107 LONG -79.948151	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/21/21 TIME 9:15___ [✓ AM] PM REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____% ☐	%cloud cover	☐ ____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17⁰ C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Perennial, intermittent and ephemeral designations were based upon observed water flow at the time of the site visit. No other criteria were used for this designation.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-5

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Groundwater/ Runoff

Catchment Area_________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☒ Shrubs ☐ Grasses ☒ Herbaceous

dominant species present tree of heaven, garlic mustard, honeysuckle

INSTREAM FEATURES

Estimated Reach Length 39.01 m

Estimated Stream Width 1.2 m

Sampling Reach Area _______m²

Area in km² (m²x1000) _______km²

Estimated Stream Depth .6 m

Surface Velocity (at thalweg) _______m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☒ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☒ Run 100 %
☐ Pool_______%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m²

Density of LWD _______m²/km² **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present ____

Portion of the reach with aquatic vegetation ___0__%

WATER QUALITY

Temperature 16.5 ⁰ C

Specific Conductance 939 uS/cm

Dissolved Oxygen N/A

pH 8.37

Turbidity N/A

WQ Instrument Used Oakton

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other________________________

Turbidity (if not measured)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other__________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	50
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	50
Gravel	2-64 mm (0.1"-2.5")	20			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	35			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET - LOW GRADIENT STREAMS

STREAM NAME Channel -5	LOCATION South of runway 10-28 AGC
STATION #______ RIVERMILE_________	STREAM CLASS Perennial
LAT 40.355107 LONG -79.948151	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/21/21 TIME 9:15 [✓ AM] PM REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 [✓ 2] 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0

	Habitat Parameter	**Condition Category**			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated broader than sampling reach	**6. Channel Alteration**	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 19	20 [✓ 19] 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
	SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
	SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
	SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 104

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel-6*	LOCATION South of runway 10-28 AGC	
STATION #_________ RIVERMILE_________	STREAM CLASS Perennial	
LAT 40.355125 LONG -79.943952	RIVER BASIN Streets Run - Monongahela	
STORET #	AGENCY Collective Efforts	
INVESTIGATORS D. Costantini, B. Shea, R. Galloway		
FORM COMPLETED BY B. Shea	DATE 05/20/21 TIME 12:14 AM PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17° C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Perennial, intermittent and ephemeral designations were based upon observed water flow at the time of the site visit. No other criteria were used for this designation.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-6

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Ground Water/ Runoff

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other ______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous

dominant species present honeysuckle

INSTREAM FEATURES

Estimated Reach Length 71.32 m

Estimated Stream Width 1.2 m

Sampling Reach Area _______m^2

Area in km^2 (m^{2}x1000) _______km^2

Estimated Stream Depth 0.6 m

Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☒ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☒ Run 100 %
☐ Pool_______%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2

Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present ____

Portion of the reach with aquatic vegetation ___0__%

WATER QUALITY

Temperature 12.7 ^{0} C

Specific Conductance 895 uS/cm

Dissolved Oxygen N/A

pH 8

Turbidity N/A

WQ Instrument Used Oakton Pocket Tester

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other________________________

Turbidity (if not measured)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☒ Other_____N/A________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	45
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	35	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	20	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	35			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel-6	LOCATION South of runway 10-28 AGC
STATION #_________ RIVERMILE_________	STREAM CLASS Perennial
LAT 40.355125 LONG -79.943952	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/20/21 TIME 12:14 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 19	20 [✓ 19] 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 93

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel-7*

LOCATION South of runway 10-28 AGC

STATION #________ RIVERMILE________

STREAM CLASS Perennial

LAT 40.355125 LONG -79.943952

RIVER BASIN Streets Run - Monongahela

STORET #

AGENCY Collective Efforts

INVESTIGATORS D. Costantini, B. Shea, R. Galloway

FORM COMPLETED BY B. Shea

DATE 05/20/21
TIME 12:14 AM PM

REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____% ☐	%cloud cover	☐ ____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17⁰ C

Other________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Perennial, intermittent and ephemeral designations were based upon observed water flow at the time of the site visit. No other criteria were used for this designation.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-7

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Ground Water/ Runoff

Catchment Area__________km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☐ Grasses ☐ Herbaceous
dominant species present honeysuckle

INSTREAM FEATURES

Estimated Reach Length 37 m
Estimated Stream Width 1.2 m
Sampling Reach Area _______m^2
Area in km^2 (m^{2}x1000) _______km^2
Estimated Stream Depth 0.6 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☒ Shaded
High Water Mark _______m
Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☒ Run 100 %
☐ Pool_______%
Channelized ☐ Yes ☒ No
Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2
Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae
dominant species present ____
Portion of the reach with aquatic vegetation ___0__%

WATER QUALITY

Temperature 12.7 °C
Specific Conductance 895 uS/cm
Dissolved Oxygen N/A
pH 8
Turbidity N/A
WQ Instrument Used Oakton Pocket Tester

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other_________________________

Turbidity (if not measured)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☒ Other_____N/A________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	45
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	35	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	20	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	35			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel-7	LOCATION South of runway 10-28 AGC
STATION #_________ RIVERMILE_________	STREAM CLASS Perennial
LAT 40.355125 LONG -79.943952	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/20/21 TIME 12:14 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation	

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE 11	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 19	20 [✓ 19] 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 93

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -8*	LOCATION South of runway 10-28 AGC
STATION #________ RIVERMILE________	STREAM CLASS Perennial
LAT 40.355092 LONG -79.945159	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	

FORM COMPLETED BY R. Galloway, B. Shea	DATE 05/20/21 TIME 11:45 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17° C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Perennial, intermittent and ephemeral designations were based upon observed water flow at the time of the site visit. No other criteria were used for this designation.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-8

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Groundwater

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☒ Shrubs ☐ Grasses ☒ Herbaceous
dominant species present garlic mustard, honeysuckle

INSTREAM FEATURES

Estimated Reach Length 19.5 m
Estimated Stream Width 1.8 m
Sampling Reach Area _______m²
Area in km² (m²x1000) _______km²
Estimated Stream Depth 1.2 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☒ Run 100 %
☐ Pool_______%

Channelized ☐ Yes ☒ No
Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m²
Density of LWD _______m²/km² **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae
dominant species present none
Portion of the reach with aquatic vegetation _____%

WATER QUALITY

Temperature 14.2 °C
Specific Conductance 890 uS/cm
Dissolved Oxygen N/A
pH 8.72
Turbidity N/A
WQ Instrument Used Oakton Pocket Tester

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other________________________

Turbidity (if not measured)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other__________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	50
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	25	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	15			
Sand	0.06-2mm (gritty)	30	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	30			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel -8	LOCATION South of runway 10-28 AGC	
STATION #_________ RIVERMILE_________	STREAM CLASS Perennial	
LAT 40.355092 LONG -79.945159	RIVER BASIN Streets Run - Monongahela	
STORET #	AGENCY Collective Efforts	
INVESTIGATORS D. Costantini, B. Shea, R. Galloway		
FORM COMPLETED BY R. Galloway, B. Shea	DATE 05/20/21 TIME 11:45 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 16	20 19 18 17 [✓ 16]	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 2 (LB)	Left Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
SCORE 2 (RB)	Right Bank 10 9	8 7 6	5 4 3	[✓ 2] 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 101

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -9*	LOCATION North west of runway 10-28 AGC
STATION #_________ RIVERMILE_________	STREAM CLASS Stormwater Outfall
LAT 40.355609 LONG -79.942384	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/21/21 TIME 11:40 [✓ AM] PM
	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17 ^{0} C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel - 9 begins at a culvert at the upstream end and conveys storm water from the airport runway.

See figures attached to report. Figure 4 and Figure 5 show the general location of Channel-9

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other ________________
☐ Residential

Local Watershed NPS Pollution
☒ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☒ Herbaceous

dominant species present goldenrod,garlic mustard, honeysuckle

INSTREAM FEATURES

No flowing water present

Estimated Reach Length 167 m
Estimated Stream Width 1.5 m
Sampling Reach Area _______m²
Area in km² (m²x1000) _______km²
Estimated Stream Depth 0.76 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☐ Pool_______%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m²
Density of LWD _______m²/km² **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present none

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature________ ^{0} C
Specific Conductance________
Dissolved Oxygen ________
pH ________
Turbidity ________
WQ Instrument Used _______________

Water Odors
☐ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☐ None ☐ Other_____________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

No flowing water present

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other_________________________________

Oils
☐ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		20	Detritus	sticks, wood, coarse plant materials (CPOM)	40
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	15	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	25	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	20			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel -9

LOCATION North west of runway 10-28 AGC

STATION #_________ RIVERMILE_________

STREAM CLASS Stormwater Outfall

LAT 40.355609 LONG -79.942384

RIVER BASIN Streets Run - Monongahela

STORET #

AGENCY Collective Efforts

INVESTIGATORS D. Costantini, B. Shea, R. Galloway

FORM COMPLETED BY B. Shea

DATE 05/21/21

TIME 11:40 [✓ AM] PM

REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 4	20 19 18 17 16	15 [✓ 14] 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0

Total Score 68

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -10 (a)*	LOCATION North of runway 10-28 AGC
STATION #________ RIVERMILE________	STREAM CLASS Stormwater Outfall
LAT 40.355254 LONG -79.923841	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 7:50 [✓ AM] PM
	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☒ Yes ☐ No

Air Temperature 19^0 C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel - 10 begins at a culvert that conveys storm water runoff from the airport runway.

See figures attached to report. Figure 4 and Figure 6 show the general location of Channel-10

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☒ Grasses ☒ Herbaceous

dominant species present Goldenrod, garlic mustard, honeysuckle,ragweed, rosa multiflora

INSTREAM FEATURES

Estimated Reach Length 54 m
Estimated Stream Width 0.9 m
Sampling Reach Area _______m²
Area in km² (m²x1000) _______km²
Estimated Stream Depth 0.9 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☒ Pool 10 %

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m²
Density of LWD _______m²/km² **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present none

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

Temperature 13.8 ⁰ C
Specific Conductance 537 uS/cm
Dissolved Oxygen N/A
pH 7.92
Turbidity N/A
WQ Instrument Used Oakton Pocket tester

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other________________________

Turbidity (if not measured)
☐ Clear ☒ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	65
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	5			
Sand	0.06-2mm (gritty)	35	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	40			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET - LOW GRADIENT STREAMS

STREAM NAME *Channel -10 (a)*

LOCATION North of runway 10-28 AGC

STATION #______ RIVERMILE_________

STREAM CLASS Stormwater Outfall

LAT 40.355254 LONG -79.923841

RIVER BASIN Streets Run - Monongahela

STORET #

AGENCY Collective Efforts

INVESTIGATORS D. Costantini, B. Shea, R. Galloway

FORM COMPLETED BY B. Shea

DATE 05/25/21

TIME 7:50 [✓ AM] PM

REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 [✓ 2] 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 16	20 19 18 17 [✓ 16]	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 11	20 19 18 17 16	15 14 13 12 [✓ 11]	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 3 (RB)	Right Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0
SCORE 9 (RB)	Right Bank 10 [✓ 9]	8 7 6	5 4 3	2 1 0

Total Score 99

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Channel -10 (b)	LOCATION North of runway 10-28 AGC	
STATION #________ RIVERMILE________	STREAM CLASS Stormwater Outfall	
LAT 40.355318 LONG -79.923287	RIVER BASIN Streets Run - Monongahela	
STORET #	AGENCY Collective Efforts	
INVESTIGATORS D. Costantini, B. Shea, R. Galloway		
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 9:30 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☒ Yes ☐ No

Air Temperature 19° C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel - 10 begins at a culvert and conveys storm water runoff from the runway.

See figures attached to report. Figure 4 and Figure 6 show the general location of Channel-10

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest
☐ Field/Pasture
☐ Agricultural
☐ Residential
☐ Commercial
☒ Industrial
☐ Other _______________

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☒ Grasses ☒ Herbaceous

dominant species present Goldenrod, garlic mustard, honeysuckle,ragweed, rosa multiflora

INSTREAM FEATURES

Estimated Reach Length 99____m

Estimated Stream Width 1.2____m

Sampling Reach Area _______m^2

Area in km^2 (m^2x1000) _______km^2

Estimated Stream Depth 0.6____m

Surface Velocity (at thalweg) _N/A_m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☒ Pool_10____%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2

Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present __none__________________________________

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature_N/A_ °C

Specific Conductance_N/A__

Dissolved Oxygen _N/A__

pH _N/A__

Turbidity __N/A_

WQ Instrument Used ______N/A____

Water Odors
☐ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☐ None ☐ Other____________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	65
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	30			
Sand	0.06-2mm (gritty)	35	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	35			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET - LOW GRADIENT STREAMS

STREAM NAME Channel -10 (b)	LOCATION North of runway 10-28 AGC
STATION #______ RIVERMILE_________	STREAM CLASS Stormwater Outfall
LAT 40.355318 LONG -79.923287	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 7:50 [✓ AM] PM REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 [✓ 2] 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

Parameters to be evaluated broader than sampling reach	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 15	20 19 18 17 16	[✓ 15] 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	SCORE 10	20 19 18 17 16	15 14 13 12 11	[✓ 10] 9 8 7 6	5 4 3 2 1 0
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
	SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 5 (LB)	Left Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
	SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
	SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 85

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -11*	LOCATION North of runway 10-28 AGC	
STATION #________ RIVERMILE________	STREAM CLASS Stormwater Outfall	
LAT 40.355337 LONG -79.923132	RIVER BASIN Streets Run - Monongahela	
STORET #	AGENCY Collective Efforts	
INVESTIGATORS D. Costantini, B. Shea, R. Galloway		
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 9:00 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 17° C

Other____________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel - 11 begins at a culvert that conveys storm water runoff from the airport runway.

See figures attached to report. Figure 4 and Figure 6 show the general location of Channel-11

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest
☐ Field/Pasture
☐ Agricultural
☐ Residential
☐ Commercial
☒ Industrial
☐ Other ________________

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☒ Grasses ☒ Herbaceous

dominant species present garlic mustard, honeysuckle,catchweed

INSTREAM FEATURES

No flowing water present

Estimated Reach Length 75 m
Estimated Stream Width 1.5 m
Sampling Reach Area _______m^2
Area in km^2 (m^2x1000) _______km^2
Estimated Stream Depth 0.6 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☐ Pool_______%

Channelized ☐ Yes ☒ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2
Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present none

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature N/A °C
Specific Conductance N/A
Dissolved Oxygen N/A
pH N/A
Turbidity N/A
WQ Instrument Used N/A

Water Odors
☐ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☐ None ☐ Other_________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

No flowing water present

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other________________________________

Oils
☐ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_______________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☐ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	65
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	15	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	35	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	40			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET - LOW GRADIENT STREAMS

STREAM NAME Channel -11	LOCATION North of runway 10-28 AGC
STATION #______ RIVERMILE_________	STREAM CLASS Stormwater Outfall
LAT 40.355337 LONG -79.923132	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 9:00 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 [✓ 3] 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 [✓ 6]	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

Parameters to be evaluated broader than sampling reach

Habitat Parameter	**Condition Category**			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 18	20 19 [✓ 18] 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE 7	20 19 18 17 16	15 14 13 12 11	10 9 8 [✓ 7] 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank [✓ 10] 9	8 7 6	5 4 3	2 1 0

Total Score 86

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME *Channel -12*	LOCATION North east of runway 10-28 AGC
STATION #_________ RIVERMILE_________	STREAM CLASS Stormwater Outfall
LAT 40.356030 LONG -79.91729	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	

FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 11:35 [✓ AM] PM	REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

WEATHER CONDITIONS	**Now**		**Past 24 hours**	**Has there been a heavy rain in the last 7 days?** ☐ Yes ☒ No
	☐	storm (heavy rain)	☐	**Air Temperature** 19 ° C
	☐	rain (steady rain)	☒	
	☐	showers (intermittent)	☐	**Other**______________________________
	____%☐	%cloud cover	☐____%	
	☒	clear/sunny	☐	

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel - 12 begins at a culvert and conveys storm water runoff from the airport runways.

See figures attached to report. Figure 4 and Figure 7 show the general location of Channel-12

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Culvert

Catchment Area__________km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other ________________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☒ Herbaceous

dominant species present Crown vetch,garlic mustard, honeysuckle,sumac

INSTREAM FEATURES

No flowing water present

Estimated Reach Length 76 m
Estimated Stream Width 1.5 m
Sampling Reach Area _______ m^2
Area in km^2 (m^{2}x1000) _______ km^2
Estimated Stream Depth 0.3 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☒ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark _______ m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☐ Pool_______%

Channelized ☒ Yes ☐ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______ m^2
Density of LWD _______ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present none

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature N/A °C
Specific Conductance N/A
Dissolved Oxygen N/A
pH N/A
Turbidity N/A
WQ Instrument Used N/A

Water Odors
☒ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other_________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☒ None ☐ Other_________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_________________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_________________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	80
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	45	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	0			
Clay	< 0.004 mm (slick)	0			

Channelized stream bed, Cobble gabion, vegetation growing through it.

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel -12	LOCATION North east of runway 10-28 AGC
STATION #_________ RIVERMILE__________	STREAM CLASS Stormwater Outfall
LAT 40.356030 LONG -79.91729	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 11:35 [✓ AM] PM REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	**Condition Category**			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 11	20 19 18 17 16	15 14 13 12 [✓ 11]	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	**Condition Category**			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 [✓ 8] 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 [✓ 3]	2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	[✓ 5] 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 7 (LB)	Left Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
SCORE 7 (RB)	Right Bank 10 9	8 [✓ 7] 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0

Total Score 76

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)

STREAM NAME *Channel -13*	LOCATION South of runway 10-28 AGC
STATION #________ RIVERMILE________	STREAM CLASS Stormwater Outfall
LAT 40.356796 LONG -79.9416506	RIVER BASIN Streets Run - Monongahela
STORET #	AGENCY Collective Efforts
INVESTIGATORS D. Costantini, B. Shea, R. Galloway	
FORM COMPLETED BY B. Shea	DATE 05/25/21 TIME 12:30 [✓ AM] PM
REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation	

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____%☐	%cloud cover	☐____%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days?
☐ Yes ☒ No

Air Temperature 19 ⁰ C

Other___________________________________

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

Channel - 13 is a man made drainage ditch that conveys storm water runoff from the surrounding area.

See figures attached to report. Figure 4 and Figure 7 show the general location of Channel-13

Appendix A includes photographs of all channels

STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☐ Mixture of origins
☒ Other Surface water

Catchment Area_________km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☒ Industrial
☐ Agricultural ☐ Other _______________
☐ Residential

Local Watershed NPS Pollution
☐ No evidence ☒ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☐ None ☒ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☐ Trees ☐ Shrubs ☐ Grasses ☒ Herbaceous

dominant species present garlic mustard, honeysuckle__________

INSTREAM FEATURES

No flowing water present

Estimated Reach Length 89.5 m
Estimated Stream Width 2.5 m
Sampling Reach Area _______m^2
Area in km^2 (m^2x1000) _______km^2
Estimated Stream Depth 1.2 m
Surface Velocity (at thalweg) N/A m/sec

Canopy Cover
☐ Partly open ☒ Partly shaded ☐ Shaded

High Water Mark _______m

Proportion of Reach Represented by Stream Morphology Types
☐ Riffle_______% ☐ Run_______%
☐ Pool_______%

Channelized ☒ Yes ☐ No

Dam Present ☐ Yes ☒ No

LARGE WOODY DEBRIS

LWD _______m^2
Density of LWD _______m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

dominant species present none___________________________________

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

No flowing water present

Temperature N/A °C
Specific Conductance N/A
Dissolved Oxygen N/A
pH N/A
Turbidity N/A
WQ Instrument Used N/A________

Water Odors
☐ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other________________

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs ☐ Flecks
☐ None ☐ Other_____________________

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other________

SEDIMENT/ SUBSTRATE

Odors
☐ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☒ None
☐ Other_____________________________

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other_______________

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☒ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	65
Boulder	> 256 mm (10")	40			
Cobble	64-256 mm (2.5"-10")	15	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	30	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	15			
Clay	< 0.004 mm (slick)	0			

Large boulders line the channel

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Channel -13

LOCATION South of runway 10-28 AGC

STATION #_________ RIVERMILE_________

STREAM CLASS Stormwater Outfall

LAT 40.356796 LONG -79.9416506

RIVER BASIN Streets Run - Monongahela

STORET #

AGENCY Collective Efforts

INVESTIGATORS D. Costantini, B. Shea, R. Galloway

FORM COMPLETED BY B. Shea

DATE 05/25/21

TIME 12:30 [✓ AM] PM

REASON FOR SURVEY AGC Runway Improvements, Stream Evaluation

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 [✓ 1] 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 [✓ 2] 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 20	[✓ 20] 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	[✓ 5] 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 [✓ 0]
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 1 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
SCORE 1 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 [✓ 1] 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 6 (LB)	Left Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 8 (LB)	Left Bank 10 9	[✓ 8] 7 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 [✓ 6]	5 4 3	2 1 0

Total Score 56

APPENDIX E – WETLAND QUALIFICATION RESUMES

RESUME RACHEL GALLOWAY

Ms. Galloway is an environmental scientist with Collective Efforts, LLC. Her experience includes wetland delineations and determinations, environmental habitat assessments, stream evaluations, mapping with geographic information systems, and technical report writing. Ms. Galloway's environmental background focuses on environmental permitting and GIS.

Highlights:
- Geographic information systems (GIS)
- Wetland Determination and Delineation
- Stream Identification and Assessment
- Habitat Assessment
- Public involvement
- Erosion and Sedimentation Control Plans and NPDES Permits Review

Education:
- B.S. Geography: Environmental Studies and Sustainability, Slippery Rock University of Pennsylvania
- Certification in Geographic Information Sciences, Slippery Rock University of Pennsylvania

Professional History:
- SWCA Environmental Consultants
- Schuylkill County Conservation District

Certifications, Training and Affiliations:
- Wetland Delineation 36 Hour Training via The Swamp School
- 10-Hour OSHA General Industry Safety Training
- OSHA 24-Hour Hazwoper Training
- AutoCad Essentials Training 2021
- PA Department of Transportation Certified Flagger
- 8-Hour OSHA Confined Space Entry Training
- Lifetime Member of Gamma Theta Upsilon (GTU) International Geographical Honor Society

Streams, Wetlands, Water Sampling

2021 Allegheny County Airport Authority Cargo Area 4 Wetland Delineation
Allegheny County, Pennsylvania
Ms. Galloway was part of a field team conducting wetland delineations for areas adjacent to Cargo Bay 3 within Pittsburgh International Airport (PIT). In order to complete the wetland delineations, Ms. Galloway and other team members collected and reviewed surrounding soil, vegetation, and hydrology indicators for potential wetland presence and completed wetland data forms. Responsibilities included field work, plant identification, GPS data collection, and report preparation. Ms. Galloway was the primary map producer for the project using ArcMap.

April 2021 Allegheny County Airport Authority Cargo Area 4 Tree Survey
Allegheny County, Pennsylvania
Ms. Galloway was part of a field team that conducted a tree identification survey areas adjacent to Cargo Bay 3 within Pittsburgh International Airport (PIT). Ms. Galloway utilized online resources and field guides to help with the Identification process.

2020 / 2021 - Allegheny County Airport Authority Annual Outfall Inspection and Report
Borough of West Mifflin, Allegheny County, Pennsylvania
Ms. Galloway inspected several stormwater outfalls for the Allegheny County Airport (AGC). Inspections were done to determine integrity of the infrastructures, and to ensure discharges of pollutants were being minimized by control measures. Wet weather water sampling was also done to test for various parameters such as pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended soils (TSS), ammonia-nitrogen, and total dissolved solids (TDS).

2021 GAI PIT Summer Field Investigation - Stormwater Outfall Inspections at PIT
Pittsburgh International Airport, Allegheny County, Pennsylvania
Mr. Galloway conducted wet weather water sampling during the summer season to test for the presence of various parameters such as pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended soils (TSS), ammonia-

nitrogen, and total dissolved solids (TDS). These tests will be used as a basis for samples that will be conducted during the deicing season.

2021 Allegheny County Airport Authority – Beaver County Conservation District Mitigation Wetland Inspection
Independence Township, Beaver County, Pennsylvania
Ms. Galloway was a member of the field team that conducted a wetland and stream evaluation at Independence Marsh located in Beaver County in a wetland area previously established for mitigation purposes. The field crew identified vegetation and structures within the marsh. Ms. Galloway assisted with completing the wetland data forms, evaluate soils, report writing, and figure creation. The data collected was used to determine if Independence Marsh was effectively performing the common functions and values for wetlands, as it was designed to do. He also identified the numerous structures constructed in the stream for mitigation purposes, and an overflow structure designed to channel water to Raccoon Creek during high flood events.

Wetland Determination Camp Meeting Road Slide Repair
Bell Acres Borough, Allegheny County, Pennsylvania
Ms. Galloway was a member of a team determining the presence of potential wetlands for the Allegheny County Department of Public Works (ACDPW) as part of preliminary design work associated with the rehabilitation of Camp Meeting Road where a landslide occurred. The project also included the replacement of a 36-inch diameter culvert with a larger culvert to convey the 10-year storm event. The wetland determination included a desktop review and evaluation of background mapping and historical information to determine if the potential for wetland and streams existed within the project area. Ms. Galloway conducted a site walk to visually assess the potential for wetlands and streams within the project area. Her responsibilities included field work, plant identification, GPS navigation and data collection, and report preparation.

January 2021 / July 2021 - Hanoverton Wetland Delineation and Stream Evaluation
Hanoverton Township, Columbiana County, Ohio
Ms. Galloway assisted with conducting wetland delineations and stream evaluations for areas within Hanover Township located in Columbiana County, Ohio for the Hanoverton Sewer Collection System Improvements Project.. To complete the wetland delineations, Ms. Galloway collected and reviewed surrounding soil, vegetation, and hydrology indicators for potential wetland presence and completed wetland data forms. Wetlands and streams located within the study area were evaluated according to Ohio EPA protocols. Ms. Galloway's responsibilities included field work, plant identification, GPS data collection, completing the necessary wetland and stream data forms, and report preparation. Ms. Galloway was the primary map producer for the project using ArcMap.

McClarens Run Road Wetland Delineation and Stream Evaluation
Moon Township, Allegheny County, Pennsylvania
Ms. Galloway was a member of a team determining the presence of potential wetlands for the Allegheny County Department of Public Works (ACDPW) as part of preliminary design work associated with the rehabilitation McClaren Road where a landslide occurred. This project consists of improvements along approximately 650 linear feet of McClaren Road which contains a collapsed retaining wall and drainage issues. The wetland determination included a desktop review and evaluation of background mapping and historical information to determine if the potential for wetland and streams existed within the project area. In addition to the desktop review, Ms. Galloway also completed a PNDI Search. Ms. Galloway conducted a site walk to visually assess the potential for wetlands and evaluated streams within the project area. Her responsibilities included field work, plant identification, GPS navigation and data collection, and report preparation. Ms. Galloway was the primary map producer for the project using ArcMap.

PWSA Highland Reservoir No. 2 Monitoring Well Measurements
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway was part of a field team that collected water level data for the twelve wells selected to be monitored to analyze the slope stability and seepage of the Highland Reservoir No. 2. As part of the field team for this project, Ms.

Galloway was responsible for environmental sampling, documenting sampling data, and compiling information for reports, and report preparation.

May 2021 - Aspinwall Pump Station Improvements and Clearwell Emergency Bypass Response Project Wetland Determination
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway conducted a wetland determination investigation for the Pittsburgh Water and Sewer Authority's (PWSA's) Aspinwall Pump Station Improvements and Clearwell Emergency Bypass Response Project. The project site is located along Freeport Road, along the Allegheny River, and adjacent to Aspinwall Borough and Fox Chapel Township. Following the field work, Ms. Galloway prepared the written report summarizing the findings and necessary figures.

May 2021 - Bruecken Pump Station Improvements Project Wetland Determination
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway conducted a wetland determination investigation for the Pittsburgh Water and Sewer Authority's (PWSA's) Bruecken Pump Station Improvements Project. The project site is located near the intersection of Washington and Allegheny River Boulevards. PWSA's Aspinwall Water Treatment Plant (and pump station) is located across the Allegheny River from the site. Following the field work, Ms. Galloway prepared the written report summarizing the findings and necessary figures.

August 2021 - ALCOSAN A-40 New Access Manhole Shaft Project Wetland Determination
City of Pittsburgh, Allegheny County, Pennsylvania
MS. Galloway conducted a wetland determination as part of the permitting process for the project. A General Permit (GP-11) is required for this project. This project area investigated included the narrow strip of land between the Allegheny River and adjacent railroad. ALCOSAN is proposing to install a new access shaft manhole on the south bank of the Allegheny River over the 48-inch Allegheny River deep tunnel interceptor just east of the existing A-40 diversion structure. Following the field work, Ms. Galloway prepared the written report summarizing the findings and necessary figures.

ESAs

Swinburne Bridge Replacement Project Phase I ESA
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway assisted with a Phase I Environmental Site Assessment (ESA) for bridge replacement in the Four Mile Run, South Oakland, and Greenfield neighborhoods in the City of Pittsburgh. Ms. Galloway identified potential environmental concerns throughout the area of interest and recorded pertinent information. She conducted interviews with local officials and residents regarding the sites. In advance of field reconnaissance, Ms. Galloway prepared the Health and Safety Plan (HASP) for the site visits. In addition, she thoroughly reviewed environmental records pertaining to the site, including EDR reports. Her responsibilities also included environmental sampling, site reconnaissance, assessment of the property and buildings, and Phase I ESA report preparation. Ms. Galloway was the primary map producer for the project using ArcMap.

Cardello Electric Supply Company Phase II ESA
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway assisted with a Phase II Environmental Site Assessment (ESA) for the Cardello Electric Supply Company Site, located in the City of Pittsburgh. Ms. Galloway collaborated on the preparation of the Phase II ESA report. Ms. Galloway researched and prepared addendums to the Phase II ESA to accurately reflect the site's current conditions. Additionally, Ms. Galloway prepared the Health and Safety Plan (HASP) for the site visits.

Permits, Research, Other Fieldwork

PWSA Curb Box Inspections
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway handled the permitting and restricted parking coordination for the PWSA Curb Box Inspection project. Responsibilities include coordination with the Pittsburgh Parking Authority, interfacing with inspection crews, coordination of flagging efforts, and utilization of mapping to determine areas of no parking. In addition to her current responsibilities, she responds directly to telephone and email inquiries and concerns from residents and maintains a database of resident inquiries.

2021 - Cargo Area 4 at Pittsburgh International Airport
Pittsburgh International Airport, Allegheny County, Pennsylvania

- Ms. Galloway was part of the Collective Efforts team preparing Erosion and Sediment Control (E&SC) and stormwater management (SWM) facilities for the Cargo Area 4 site and excess fill disposal site. Ms. Galloway Using Civil 3D, she assisted both an Erosion and Sediment Control Plan and a stormwater management requiring site plans, profiles, and details.

- Ms. Galloway assisted in completing the preparation of an erosion and sediment control plan and NPDES permit application package for stormwater discharge from construction activities. The NPDES Permit Application Package for the construction of this project included the required permit documents, modules; General Information Form, and notification letters to the local municipality and county governments to comply with Acts 14, 67, 68, and 127.

- Ms. Galloway assisted in the preparation of environmental clearance documentation, including the completion Level 2 Categorical Exclusion Evaluation (CEE), using PennDOT's Engineering and Construction Management System (ECMS). Ms. Galloway used several environmental and engineering resources to gather pertinent information to determine the significance of project impacts. Responsibilities include recording and entering project details, descriptions of project activities, and project requirements into the ECMS system.

2021 – Pittsburgh International Airport – ACAA Integrated Contingency Plan
Moon Township, Allegheny County, Pennsylvania
Ms. Galloway assisted in updating the Integrated Contingency Plan (ICP) for the Pittsburgh International Airport (PIT). The ICP identifies procedures, resources, and emergency response organization to be exercised in an emergency at the Pittsburgh International Airport. The ICP identifies sensitive receptors located downstream of the Pittsburgh International Airport in the event of a hazardous material leak or spill. Spilled material leaving the site could enter McClarens Run and travel through Montour Run to the Ohio River. Ms. Galloway created coordinated with state and federal agencies within P Pennsylvania, Ohio, and West Virginia to assess the fish and wildlife and sensitive environments located along the ICP downstream planning limits. Ms. Galloway also created figures necessary to include as attachments in the ICP.

June 2021 - Lime Slurry System Improvements – Public Water Supply Permit
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Galloway assisted in the completion of the Public Water Supply (PWS) Permit Application for the Lime Slurry System Improvements for the Aspinwall Water Treatment Plant for the Pittsburgh Water and Sewer Authority (PWSA). Ms. Galloway completed various modules and checklists pertaining to the permit application, as well as gathered various pertinent documents to add to the permit application.

Previous Work Experience:

Endangered and Threatened Species Habitat Assessment (SWCA Environmental Consultants, 2018-2019)
Prior to joining Collective Efforts, Ms. Galloway has taken part in several endangered and threatened species habitat assessment projects within Pennsylvania, Ohio, and West Virginia. Ms. Galloway's experience includes assessing field sites for potential roost habitat, aiding on mist net surveys to determine the presence or probable absence of bat species (primarily *M. sodalist* and *M. septentrionalis*), conducting desktop analysis of critical habitat for threatened and endangered species, and assisting with Endangered Species Act and NEPA compliance reporting and permitting.

Wetland Delineation and Determination (SWCA Environmental Consultants, 2018-2019)
Prior to joining Collective Efforts, Ms. Galloway has taken part in several wetland delineation and determinations within Pennsylvania, West Virginia, Ohio, New York, and Texas, primarily for energy sector projects. In order to complete wetland delineations, Ms. Galloway conducted desktop analysis of background mapping and historical information to identify potential wetlands and conduct field evaluation. In order to complete the field evaluation, Ms. Galloway collected and reviewed surrounding soil, vegetation, and hydrology indicators for potential wetland presence and completed the associated wetland data forms. Associated stream identification included evaluation for macroinvertebrate presence, substrate type, and hydrological condition. Responsibilities included field work, plant identification, macroinvertebrate identification, GPS data collection, and report preparation. Ms. Galloway has completed the 36 Hour Wetland Delineation Training Via The Swamp School.

Stream Surveying and Evaluation (SWCA Environmental Consultants, 2018-2019)
Prior to joining Collective Efforts, Ms. Galloway has taken part in several stream evaluation projects withing Pennsylvania and West Virginia to evaluate the water quality, stream habitat, and benthic macroinvertebrate populations within mitigation streams. Responsibilities while working on these projects included conducting field work, stream habitat assessments, measuring stream's physical characteristics such as flow and bank depth and width, and aquatic macroinvertebrate collection and identification.
Additional experience includes assisting/conducting wetland and stream identification. Stream identification included evaluating streams for macroinvertebrate presence, substrate type, and hydrological conditions.

GIS Mapping and Data Collection (SWCA Environmental Consultants, 2018-2019)
Prior to joining Collective Efforts, Ms. Galloway provided GIS support for a variety of projects. Responsibilities included field data, post processing field, data analysis, data management, and creating maps for the reports and permit packages.

Erosion and Sediment Control Plans and NPDES Permitting (Schuylkill County Conservation District, 2020)
Schuylkill County, Pennsylvania
Prior to Collective Efforts, Ms. Galloway has conducted completeness and technical reviews of Erosion and Sediment Control Plans and NPDES Permits for earthmoving activities within Schuylkill County, Pennsylvania. Conducted site inspections to ensure that erosion and sediment control plan and post construction stormwater management measures are being implemented according to the approved plans and permits.

RESUME DOMINIC COSTANTINI

Highlights:
- Projects located in PA and OH
- Wetland delineations
- Stream assessments and water quality assessments

Education:
- B.S. Environmental Studies Concentration: Environmental Science, California University of Pennsylvania
- Minor: Geology, California University of Pennsylvania

Professional History:
- Collective Efforts, LLC

Certifications, Training and Affiliations:
- OSHA 10-Hour Construction Safety Training
- OSHA 8-Hour Confined Space Training
- Flagger Training
- OSHA 24-Hour Hazwoper Training
- NASSCO – PACP, MACP, LACP Training
- Port Authority – Track Access Training

Mr. Costantini is an environmental scientist at Collective Efforts, LLC. His expertise in the environmental field includes stream evaluations, wetland delineations, soil sampling, and plant identification. In addition, Mr. Costantini has experience as a Construction Inspector for various infrastructure projects.

NEORSD Stormwater Master Plan
Cuyahoga County, Ohio
Mr. Costantini was a member of the field crew for the Northeast Ohio Regional Sewer District (NEORSD) Cuyahoga North Stormwater Management (SWM) Plan project. Field crews assessed streambank stability using the Rosgen fluvial geomorphology (FGM) modified bank erosion hazard index (BEHI) and near bank stress (NBS) methodologies. Data was collected using data asset management programs (Collector and Survey 1-2-3) and a tablet device with connectivity to the NEORSD ArcGIS OnLine (AGOL) mapping. Data collected in the field was uploaded in real time for approximately 17 miles of streams within the Cuyahoga North service area. Information about streambank slope, vegetative cover, streambank and streambed composition, the presence of walls, and information pertinent to streambank stability was collected for stream segments and areas near buildings, transportation and utilities (BTUs) that had been identified as potentially threatened by excessive erosion in the streams.

2021 – Pittsburgh International Airport – ACAA Integrated Contingency Plan
Moon Township, Allegheny County, Pennsylvania
Mr. Costantini assisted in updating the Integrated Contingency Plan (ICP) for the Pittsburgh International Airport (PIT). The ICP is intended to serve as the primary resource document for personnel at PIT who have a role in preventing and responding to emergencies or spills of oil or hazardous materials. PIT is subject to several emergency planning and response regulations that require the preparation of emergency response, spill preparedness, or contingency plans. This ICP combines the applicable regulatory requirements into a single integrated plan designed to minimize hazards to human health and/or the environment from fires, explosions, and discharges of oil and hazardous materials. Mr. Costantini updated the inventory of sensitive receptors in the PIT area and within the spill scenario area. Sensitive receptors included hospitals, care homes, schools, national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas which could be exposed to an accidental release. He used several resources to update the information in the ICP. He also updated the spill response contractor information necessary to include in the ICP. This included information on the emergency contractor response time,

available equipment and spill response supplies, contract terms with PIT, and any training that their personnel received.

ACAA BCCD Wetland Mitigation Site Determination
Beaver County, Pennsylvania
Mr. Costantini was a member of the field team that conducted a wetland and stream evaluation at Independence Marsh located in Beaver County in a wetland area previously established for mitigation purposes. The field crew identified vegetation and structures within the marsh. Mr. Costantini assisted with completing the wetland data forms and evaluating soil samples. The data collected was used to determine if Independence Marsh was effectively performing the common functions and values for wetlands, as it was designed to do. He also identified the numerous structures constructed in the stream for mitigation purposes, and an overflow structure designed to channel water to Raccoon Creek during high flood events.

Chatham Storm Water Sewers Investigation
Allegheny County, Pennsylvania
Mr. Costantini was part of the field team investigating infrastructure at Chatham University to allow for design and implementation of a new catch basin system. By using maps depicting the existing sewer system, the team marked and confirmed locations and flow patterns of the sewer lines. The sewer lines were evaluated using closed circuit television (CCTV) to identify sanitary sewer lines versus storm sewer lines. The team also utilized dye testing to determine the path of the flow to and from the catch basins that were not able to be viewed via CCTV.

ACAA Cargo Area 3 Wetland Jurisdictional Delineations
Allegheny County, Pennsylvania
Mr. Costantini was a member of the field team responsible for delineating wetland areas at the Pittsburgh International Airport (PIT) for ACAA. The project area was located adjacent to the Cargo Area 3 taxiway and covered approximately 25 acres. After the wetland delineation was completed, the results were confirmed by the Pennsylvania Department of Environmental Protection (PADEP) and the United States Army Corps of Engineers (USACE). Upon approval from PADEP and USACE, this jurisdictional delineation remains valid for five years.

PennDot Thornburgh Bridge Permitting
Allegheny County, Pennsylvania
Collective Efforts completed a waterway permit registration to meet the criteria to qualify for an E02-999 General Maintenance Permit for the Thornburg Bridge Rehabilitation Project. Mr. Costantini assisted with the completion of the District 11-0 E02-9999 Checklist which involved a project narrative, USGS mapping locations, FEMA flood mapping, Type, Size and Location (TS&L) plans, and the proposed construction work schedule.

PWSA Unmetered Flat Rate
Allegheny County, Pennsylvania
Mr. Costantini was a member of a field team for a PWSA project involving unmetered and flat rate properties. For each of the identified properties, using a mobile GIS data collector, he observed and documented the location of existing water mains, existing curb stops servicing the affected property and/or adjacent property, service line entry into the building, and the service line and internal plumbing materials, assessed the condition of the service line entry point and foundation wall and noted any landscaping present between the existing main and the residence or building. Each property was also photo documented.

Maryland Avenue Green Infrastructure
Allegheny County, Pennsylvania
Mr. Costantini was a member of a field team conducting basement inspections inside houses in the City of Pittsburgh's Shadyside area. This project was completed by Pittsburgh Water and Sewer Authority (PWSA) to ensure that the properties were structurally sound prior to the commencement of construction along on Maryland Avenue. The inspection team was tasked with inspecting and photographing cracks, supports, windows, and drains

within the basements as well as the outside perimeter of the building, noting any issues. Following the field inspection, the completed forms and photos were evaluated in the office using software to map each basement's floor plan for PWSA to reference during construction.

PWSA Lead Line Replacement
Allegheny County, Pennsylvania
Mr. Costantini provided construction inspection services for the PWSA Lead Service Line Replacement involving the replacement of water service lines known to contain lead. The site work included inspection of the replacement of public and private water service lines, curb stops, curb boxes and updates to internal plumbing. Tasks included verification of data collection per residential building, measuring and verifying materials used per project specifications, enforcement of Occupational Safety and Health Administration (OSHA) standards, compiling data using a hand-held tablet device in GIS, coordinating the timeframe and scope of work to be completed with homeowners, photographing work process, recording pay items per bid for the contractor, compiling daily site reports and detailed calculation sheets per site and delivery of pre and post water test kits, water pitchers and replacement filters for public health and safety.

Ms Consultants Monongahela River Subaqueous Interceptor Rehabilitation
Allegheny County, Pennsylvania
Mr. Costantini was part of a wetland determination field team. The team was tasked to locate and assess multiple manhole access points along the Monongahela River in the Homestead area. Each manhole that needed to be inspected required a full wetland determination for the surrounding area. Our mission was to report any wetlands that were in and around the manhole access points to allow the proper permitting to take place.

ACAA Clinton – Enlow Bridge Replacement
Allegheny County, Pennsylvania
Mr. Costantini was part of a wetland determination team tasked to inspect the surround areas of a bridge along property owned by Allegheny County Airport Authority (ACAA) along Clinton – Enlow Road for any possible wetlands. The team completed multiple wetland determinations and delineations identifying three wetlands around the bridge. Following the field work, Mr. Costantini prepared the written report summarizing the findings.

PWSA Curb Box Inspection Project
Allegheny County, Pennsylvania
Mr. Costantini assisted in the posting of "no parking" signs in various neighborhoods for this project involving inspection of residential water service line curb boxes. He was tasked with preparing the no parking cones, posting the cones in the area where inspections were being conducted, and collecting the cones from previous posting locations when the inspection crews completed their work.

Ms Consultants ALCOSAN Flap Gate Replacement
Allegheny County, Pennsylvania
Mr. Costantini worked with a field team to determine any wetlands surround the specific flap gates that needed inspected. After the wetland determination field work was finished Mr. Costantini provided the project with a PNDI form and GIS figures for any further reporting.

ACAA Cargo Area 4 Wetland Delineations
Allegheny County, Pennsylvania
Mr. Costantini was part of a team that was tasked with inspecting the entire draft area of the future cargo area 4 and the expanded taxiway. The team spent a total of four workdays walking through the project area and inspecting it for any areas that potentially be considered wetlands. Multiple points of interest were marked using the Topcon GPS system. After field work was completed Mr. Costantini and the rest of the field crew members began building the cargo area 4 wetland report by providing any plant identifications and writing materials needed.

RCI Herron and Webster Phase II ESA
Allegheny County, Pennsylvania
Mr. Costantini provided support work throughout the sampling and writing of the HASP. Mr. Costantini visited the two gas stations to record GPS points of the soil boring locations. Later in the project Mr. Costantini assisted with the data entry and analysis from the soil and ground water samples collected at the two sites.

Allegheny County Airport (AGC) Outfall Inspections/Report and Storm Water Sampling
Allegheny County, Pennsylvania
Mr. Costantini inspected several stormwater outfalls at the Allegheny County Airport (AGC) for Allegheny County Airport Authority (ACAA). Inspections were done to determine integrity of the infrastructures, and to ensure discharges of pollutants were being minimized by control measures. Wet weather water sampling was also done to test for the presence of various parameters such as pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended soils (TSS), ammonia-nitrogen, and total dissolved solids (TDS). Mr. Costantini was also part of the surveying team to reidentify AGC's stormwater outfall locations.

Ernie's Waste Oil Sheet Flow Sampling
Beaver County, Pennsylvania
Mr. Costantini was responsible for collecting the stormwater sample required for the NPDES No Exposure Certification application at Ernie's Waste Oil. The application has specific precipitation requirements that must be met before a stormwater sample is collected which include: 1) greater than 0.1-inch storm event, and 2) at least 72 hours from a previously measurable storm event (0.1 inch). A sample of the first flush of stormwater must be collected. First flush occurs within the first 30 minutes of discharge. As part of this task, Mr. Costantini monitored the weather forecast and storm events. Mr. Costantini sampled on one occasion, utilizing the sheet flow sampling method.

Cardello Electrical Supply Company Phase I and Phase II Environmental Site Assessment and Sampling
Allegheny County, Pennsylvania
Mr. Costantini assisted the Collective Efforts team on the Cardello Phase I and Phase II activities. Mr. Costantini initially accompanied Mrs. Cindy Zuch for the initial site walk and interviews for the site. During the site walk Mr. Costantini completed the appropriate forms to complete the investigation and took reference photos for later help during the report writing. Once the Phase I investigation wrapped up Collective Efforts was hired to work on the Phase II sampling activities. Mr. Costantini assisted this project by surveying the boring locations with a GPS unit and marking them on the ground.

Campbells Run Road Reconstruction Project Phase II Environmental Sampling
Allegheny County, Pennsylvania
Mr. Costantini was part of the environmental sampling team in the field during the Campbells Run Road sampling a drilling field work. Mr. Costantini initially assisted Mrs. Erica Delattre with the sampling but then became the elad of the field team for the latter half of the field sampling. Mr. Costantini was tasked with sampling soil borings collected from a vehicle mounted drill rig. They were required to be bagged scanned with a PID meter and then jarred either by TeraCore kits or sampling Jars. Mr. Costantini was also required to gather surface soil samples either collecting them from the air knifing process or using a hand auger to extract enough soil. On the final day of field work Mr. Costantini also conducted in stream sediment and surface water samples. This required the use of a pH/Spec. Conductivity/Salinity meter. After each day of sampling Mr. Costantini recorded the samples on the Chain of Custodies to be sent to the laboratory for testing.

Allegheny County Net Zero Parks Project: White Oak Park and Deer Lakes Park Phase I ESA
Allegheny County, Pennsylvania
Mr. Costantini was part of the field team that conducted the Phase I ESA site visits. During this Mr. Costantini examined each site location for any potential hazards or concerns in the area. He completed the site assessment forms and took photos during the site visits. Later, Mr. Costantini assisted in the writing portion of the Phase I report.

He conducted phone interviews with locals that potentially contained information about the history of each site.

2021 CHALET Spherical Imagery
Cleveland Ohio
Mr. Costantini worked as the team leader for the field crew in Cleveland. Mr. Costantini and two others from Collective Efforts were assigned by Wade Trim to conduct instream work involving 360-degree images and GPS tracking. The purpose of the field work was to gather any missing pieces of stream that were not properly photographed the first time. Collective Efforts also managed any streams that were too deep to maneuver, this is where they utilized kayaks to safely enter collect the stream reaches. Collective efforts were part of a two-team effort to collect approximately 14.5 miles of stream that still needed photographed before there were leaf on conditions in the surround foliage.

GAI Small Diameter Water Main Replacement Tree Survey
Allegheny County Pennsylvania
Mr. Costantini conducted a tree identification survey in multiple neighborhoods in and around Pittsburgh including Shadyside, Point Breeze, Squirrel Hill, Hazelwood, and Greenfield. All of which are part of the PWSA 2021 Small Diameter Water Main Replacement. Mr. Costantini worked in the field collecting twigs and any other samples that could be useful during the ID process. Mr. Costantini also utilized online resources to help with the Identification process since this was conducted in the winter during leaf on conditions.

(ALCOSAN) Keystone Acquisitions Braun Bakery Phase I Environmental Site Assessment
Allegheny County, Pennsylvania
Mr. Costantini conducted a Phase I ESA with Mrs. Ellen Hanna. The report is currently in the process of being finalized. Mr. Costantini performed the site walk of the old Braun Bakery Building downtown and the other two parcels which the client was also planning on purchasing. Mr. Costantini provided the upfront background investigation of the site, by ordering the EDR report and conducting interviews to provide any historic information about the site. Mr. Costantini contributed to the writing of the report and its organization.

PWSA Lime Slurry Hazardous Materials Assessment Lead Paint/ACM Sampling
Allegheny County, Pennsylvania
Mr. Costantini assisted the collective efforts team during the Hazardous Materials Assessment of the PWSA Lime Slurry System, at their Aspinwall Pump Station. Mr. Costantini was responsible for collected paint samples from different pieces of machinery that are scheduled to be removed and replaced. Mr. Costantini collected fifteen samples across three different floors within the Pump Station Building. Mr. Costantini provided the writing for Health and Safety Plan before the Collective Efforts entered the site for sampling. The writing of the report is still in progress but once lab results are returned to Collective Efforts Mr. Costantini will assist with the writing of the Hazardous Material Report.

RESUME BRIANNA SHEA

Ms. Shea is an environmental scientist at Collective Efforts, LLC. Her experience in the environmental field includes stream evaluations, soil sampling, environmental site assessments, plant identification, and GIS coursework. In addition, Ms. Shea has experience as a construction inspector for infrastructure replacement projects.

2020 - PWSA Curb Box Inspections
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Shea was a member of the field crew for Pittsburgh Water and Sewer Authority (PWSA) curb box inspections. Field crews accessed residential curb boxes to assess both private and public water service line materials using Wohler inspection cameras. Necessary attributes like curb box conditions and depth, along with internal curb box photos and external site photos proving the material determinations, were collected, and recorded using a tablet device with a data asset management program (ArcGIS Collector). Data collected in the field was uploaded in real time.

2020 - Columbiana County Phase I ESA and HTRW Assessment
Hanover Township, Columbiana County, Ohio
Ms. Shea assisted with a Phase I Environmental Site Assessment and Hazardous, Toxic and Radioactive Waste Assessment for the Hanoverton Sewer Collection System Improvement Project in Hanoverton, Ohio. Ms. Shea, along with an additional team member identified potential environmental concerns throughout the area of interest and recorded pertinent information. She conducted interviews with local officials and residents regarding the sites. In advance of field reconnaissance, Ms. Shea thoroughly reviewed environmental records pertaining to the site, including EDR reports. Her responsibilities also included site reconnaissance, assessment of the property and buildings, and Phase I ESA report preparation.

2020 - 2021 Small Diameter Water Mains Replacements Project
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Shea was a member of Collective Efforts' crew assigned to field-verify locations in the identified project area for the replacement of small diameter water mains within the PWSA service area. Several streets located in various City of Pittsburgh neighborhoods were included. Prior to the field verification, Collective Efforts populated a database identifying property addresses, property owners, block and lot numbers and stakeholders in the area. Using the database as a guide, Ms. Shea walked the area, identified discrepancies from the database, noted street trees in the area, and verified the location of stakeholders previously identified as likely to be impacted by construction.

Highlights:
- Geographic information systems (GIS)
- Invasive species control
- Stream assessments and water quality assessments
- Soil sampling
- Plant identification
- Environmental Site Assessments

Education:
- B.S. Environmental Science Concentration: Land Resources, University of Wisconsin - Stout
- Minors: GIS and Plant Science, University of Wisconsin - Stout

Professional History:
- Collective Efforts, LLC
- Lower Chippewa Invasive Partnership
- Dunn County LWCD and USDA-NRCS

Certifications, Training and Affiliations:
- OSHA 10-Hour Construction Safety Training
- OSHA Permit and Non-Permit Confined Space Entry Certification
- PA Department of Transportation Certified Flagger
- AutoCad Essentials Training 2021
- GIS Coursework

2020 - ACAA Cargo Area 4 Wetland Delineation
Allegheny County, Pennsylvania
Ms. Shea was part of a field team tasked with conducting a wetland delineation for areas within the Pittsburgh International Airport, adjacent to Cargo Area 3, where potential construction for the proposed Cargo Area 4 expansion were likely to occur. The field work conducted by Ms. Shea and other team members in the areas of interest consisted of GPS data collection, plant identification, hydrological observations, and soil sampling and classification. Once data from the four days of field work was compiled by the team, report preparation began by Ms. Shea and other team members to present the team's findings.

2020 - Hanoverton Wetland and Stream Evaluation
Hanover Township, Columbiana County, Ohio
Ms. Shea assisted with conducting wetland delineations and stream evaluations for areas within Hanover Township located in Columbiana County, Ohio. To complete the wetland delineations, Ms. Shea collected and reviewed surrounding soil, vegetation, and hydrology indicators for potential wetland presence and assisted in the completion of wetland data forms. Wetlands and streams located within the study area were evaluated according to Ohio EPA protocol. Her responsibilities included field work, plant identification, GPS data collection, and report preparation.

2020 and 2021 - Ohio NEORSD Stormwater Master Plan
Cuyahoga County, Ohio
Ms. Shea was a member of a three-person field crew for Collective Efforts that were assigned by Wade Trim to conduct instream work involving 360-degree images and GPS tracking. The purpose of the field work was to gather any missing pieces of stream that were not properly photographed the first time. Collective Efforts also managed any streams that were too deep to maneuver, this is where they utilized kayaks to safely enter collect the stream reaches. Collective efforts were part of a two-team effort to collect approximately 14.5 miles of stream that still needed photographed before there were leaf on conditions in the surround foliage.

2021 - Herron and Webster Former Gas Station Sites – Phase II Environmental Site Assessment
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Shea assisted in overseeing and conducting the fieldwork at these two adjacent former gas station sites in the Upper Hill District neighborhood in Pittsburgh. With a supervisor and team of subcontractors, they could determine if there were any potential sources of contamination at the site and if the site had been environmentally impacted. Based on the results of the ground-penetrating radar (GPR) study, groundwater, and soil from around the sites were sampled, and focused exploratory excavation was conducted. The excavation resulted in the discovery of four USTs, potential sources of contamination. Ms. Shea assisted in conducting sampling under and around the USTs and screened the analytical results against the Pennsylvania Department of Environmental Protection's (PADEP's) medium-specific concentrations (MSCs) applicable for the end use. Ms. Shea collaborated with her supervisor in documenting the field efforts and recording the potential environmental impacts at the site based on the analytical data in the Phase II ESA report.

2021 - Campbells Run Road – Phase II Environmental Assessment
Collier and Robinson Townships, Allegheny County, Pennsylvania
Ms. Shea was a member of a team that conducted a Phase II Environmental Assessment for a 1.5-mile-long site along Campbells Run Road. The team's purpose was to verify and characterize potential sources of contamination that were identified in a previous Environmental Assessment Report back in 2000. Ms. Shea assisted in the surface and subsurface sampling, quality control sampling, and sampling of Campbells Run surface water and sediment.

2021- Allegheny County Airport Authority Annual Outfall Inspection and Report
Borough of West Mifflin, Allegheny County, Pennsylvania
Ms. Shea inspected several stormwater outfalls for the Allegheny County Airport (AGC). Inspections were done to determine integrity of the infrastructures, and to ensure discharges of pollutants were being minimized by control measures. Wet weather water sampling was also done to test for various parameters such as pH, biochemical oxygen

demand (BOD), chemical oxygen demand (COD), total suspended soils (TSS), ammonia-nitrogen, and total dissolved solids (TDS).

2021 – ALCOSAN Sandcastle Waterpark – Phase I Environmental Site Assessment
West Homestead, Allegheny County, Pennsylvania
Ms. Shea assisted with a Phase I Environmental Site Assessment at the Sandcastle Waterpark site located at 1000 Sandcastle Drive in West Homestead, Allegheny County, Pennsylvania for Keystone Acquisition Corporation. This Phase I ESA was prepared under the Allegheny County Sanitary Authority's (ALCOSAN'S) Capital Project Number S-451. Ms. Shea and her partner identified potential environmental findings that could impact the feasibility of ALCOSAN's proposed future use for the site and recorded pertinent information. In advance of field reconnaissance, Ms. Shea thoroughly reviewed environmental records pertaining to the site, including EDR reports. Her responsibilities also included site reconnaissance, assessment of the property and buildings, and assisting in the Phase I ESA report preparation.

2021- AGC Runway Improvements – Wetland Delineation and Stream Evaluation
Borough of West Mifflin, Allegheny County, Pennsylvania
Ms. Shea assisted with conducting wetland delineations and stream evaluations for areas within the AOA of the Allegheny County Airport property located in the Borough of West Mifflin, Allegheny County, Pennsylvania. To complete the wetland delineations, Ms. Shea collected and reviewed surrounding soil, vegetation, and hydrology indicators for potential wetland presence and assisted in the completion of wetland data forms and stream evaluation forms. Wetlands and streams located within the study area were evaluated according to Pennsylvania EPA protocol. Her responsibilities included field work, plant identification, and report preparation.

2021- ALCOSAN Valspar/Sherwin-Williams – Phase I Environmental Site Assessment
City of Pittsburgh, Allegheny County, Pennsylvania
Ms. Shea assisted with a Phase I Environmental Site Assessment at the Valspar-Sherwin Williams site located at 2000 Westhall Street in the city of Pittsburgh, Allegheny County, Pennsylvania for Keystone Acquisition Corporation. This Phase I ESA was prepared under the Allegheny County Sanitary Authority's (ALCOSAN'S) Capital Project Number S-451. Ms. Shea and her partner identified potential environmental findings that could impact the feasibility of ALCOSAN's proposed future use for the site and recorded pertinent information. In advance of field reconnaissance, Ms. Shea thoroughly reviewed environmental records pertaining to the site, including EDR reports. Her responsibilities also included site reconnaissance, assessment of the property and buildings, and Phase I ESA report preparation.

2021 – Pittsburgh International Airport – ACAA Integrated Contingency Plan
Moon Township, Allegheny County, Pennsylvania
Ms. Shea assisted in updating the Integrated Contingency Plan (ICP) for the Pittsburgh International Airport (PIT). The ICP is intended to serve as the primary resource document for personnel at PIT who have a role in preventing and responding to emergencies or spills of oil or hazardous materials. PIT is subject to several emergency planning and response regulations that require the preparation of emergency response, spill preparedness, or contingency plans. This ICP combines the applicable regulatory requirements into a single integrated plan designed to minimize hazards to human health and/or the environment from fires, explosions, and discharges of oil and hazardous materials. Ms. Shea updated the inventory of sensitive receptors in the PIT area and within the spill scenario area. Sensitive receptors included hospitals, care homes, schools, national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas which could be exposed to an accidental release. She used several resources to update the information in the ICP. Ms. Shea also updated the spill response contractor information necessary to include in the ICP. This included information on the emergency contractor response time, available equipment and spill response supplies, contract terms with PIT, and any training that their personnel received.

Previous Work Experiences

Lower Chippewa Invasive Partnership
Dunn County, Wisconsin

While with a previous employer, Ms. Shea was a member of the field crew for the Lower Chippewa Invasive Partnership (LCIP) assisting in the identification and removal of invasive species like Amur cork trees. Mechanical methods of removal consisted of loppers and handsaws for smaller tree species. Chemical removal methods were implemented when species were too large to cut and involved shaving off the bark around the tree and applying an aquatic safe herbicide (Glyphosate). Removals occurred around the Menomonie area of Dunn County on public and private lands.

USDA-NRCS and LWCD Internship
Dunn County, Wisconsin

As a college student, Ms. Shea was a conservation intern for Dunn County's Land and Water Conservation Division (LWCD) and the United States Department of Agriculture Natural Resource Conservation Services (USDA-NRCS). During her internship she worked closely with county, state, and federal conservation agencies and local non-profit organizations including the Lower Chippewa Invasive Partnership (LCIP), U.S. Fish and Wildlife Service (USFWS), county surveying, and Department of Natural Resources (DNR) Wildlife, Fisheries, and Forestry. Her projects with the LWCD involved citizen-based stream monitoring to determine stream health based on macro-invertebrate sampling and stream characteristics. With the U.S. Fish and Wildlife Services and Trout Unlimited, Ms. Shea assisted in stream shocking in various streams to record trout populations. Duties with the USDA-NRCS involved bulk density sampling, soil sampling, GIS data management, and compliance walkthroughs of landowners and farmers enrolled in NRCS easement and incentive programs like Conservation Stewardship Program (CSP), Agricultural Conservation Easement Program (ACEP), Conservation Reserve Program (CRP), and Conservation Quality Incentives Program (EQIP).

University of Wisconsin – Stout Coursework
Dunn County, Wisconsin

As a college student, Ms. Shea took Introduction to Geographic Information Systems, Intermediate GIS, and Advanced GIS courses to fulfill the GIS minor requirements and completed a final project that included mapping bike racks and bike maintenance stations across North and South Campus for the Sustainability Office.

Appendix I

Agency Coordination and Public Involvement:

I-1: Project Fact Sheet

ALLEGHENY
COUNTY AIRPORT

May 2021

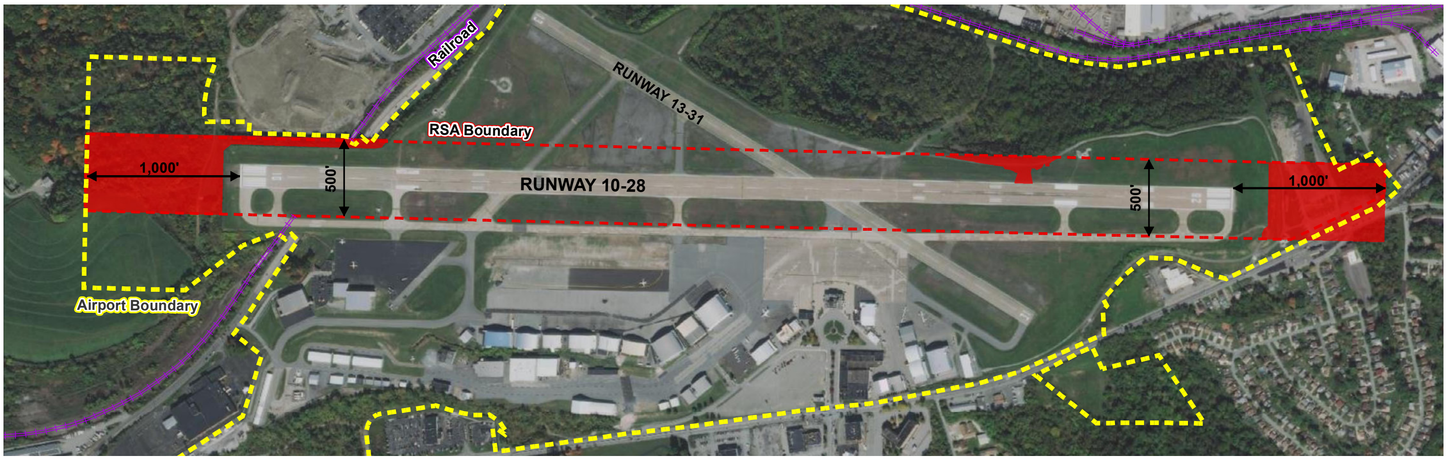
Runway Safety Area Improvements at Allegheny County Airport (AGC)

In 2021, we (the Allegheny County Airport Authority) will begin an Environmental Assessment of potential improvements to the Runway Safety Area (RSA) of Runway 10-28 at AGC. The analysis team, including engineering and environmental professionals, is studying the feasibility of several different options, which will be published for public review and comment.

An RSA enhances the safety of aircraft that undershoot, overrun, or otherwise leave the paved runway surface, and the airport must keep the RSA cleared, graded, drained, and accessible by firefighting and rescue equipment[1]. RSA standards are defined by the Federal Aviation Administration (FAA). For Runway 10-28, the RSA should extend 1,000 feet from the departure end of the runway and 500 feet from the centerline along the runway's length. FAA works with airports to find alternative solutions if land is not available or if existing obstacles make a standard RSA impossible. FAA regularly evaluates standard and non-standard RSAs and requires incremental improvements as applicable.

A standard RSA for Runway 10-28 at the Allegheny County Airport is not feasible. The RSA has been determined by previous studies and airport master plans to be 793 feet short on the eastern end, 1000 feet short on the western end, and, in some areas, steeper than the FAA standards. There is also development around the runway that cannot be reasonably relocated, such as Lebanon Road (State Highway 885) and the railroad, Lebanon Church Road (State Highway 148), the landfill, or housing developments. Since the late 1990s, we have regularly revisited alternatives or new technologies to maintain and improve aircraft safety in this area. Several properties, such as the West Mifflin Motors, were relocated as the community has worked toward RSA safety standards.

At this time, we are studying potential combinations of solutions, such as placing fill material (clean dirt or stone) in some areas along the RSA on airport property and at both ends of the Runway 10-28. To correct the slope at this end, we may install a retaining wall or extend the fill over the landfill. We are also considering the installation of an Engineered Material Arresting System (EMAS) at both ends of the runway.



Current standard RSA deficits for Runway 10-28 are highlighted in red.

STAY CONNECTED!

We will hold a public workshop to gather comments and recommendations regarding the project. Find more information about the project and the public meeting date at www.flypittsburgh.com/allegheny-county-airport/

ESTIMATED PROJECT TIMELINE:

1. **Dec 2020 to April 2021** Conduct geotechnical field survey and alternatives analysis.
2. **Spring – Fall 2021** Conduct biological field surveys and environmental impacts analysis. Document findings in Draft EA.
3. **Winter 2021** Hold public workshop and open public comment period on Draft EA.
4. **Winter 2021** Revise draft EA as necessary to address public comments.
5. **Early 2022** FAA reviews Final EA and issues environmental determination.
6. **To Be Determined** If potential project impacts are determined to be not significant, begin project design and construction.

An **Environmental Assessment (EA)** is required under the **U.S. National Environmental Policy Act (NEPA)** to determine whether a federal action has the potential to cause significant environmental effects, such as adverse impacts to air or water quality, biological resources, or human communities and economics.[2] The FAA has developed procedures for implementing NEPA that are specific to FAA's mission.[3]

An **Engineered Material Arresting System (EMAS)** uses crushable, lightweight material placed at the end of a runway to stop an aircraft that overruns the runway.[4] The tires of the aircraft sink in and the aircraft is decelerated. To date, the FAA has approved EMAS for over 1,000 runway ends at more than 500 commercial airports.

REFERENCES

[1] FAA 2012. Advisory Circular (AC) 150/5300-13A, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13A-chg1-interactive-201612.pdf

[2] EPA, 2021. NEPA Review Process. https://www.epa.gov/nepa/national-environmental-policy-act-review-process

[3] FAA, 2020. Order 1050.1F - Policies and Procedures for Considering Environmental Impacts. https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/

[4] FAA, 2020. Fact Sheet – Engineered Material Arresting System (EMAS). https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=13754

ALLEGHENY
COUNTY AIRPORT

www.flypittsburgh.com/allegheny-county-airport/
412-466-3026 | AGCInfo@FlyPittsburgh.com
Allegheny County Airport, 15 Allegheny County Airport, West Mifflin, PA 15122

I-2: Project Agency, Tribe, and Other Stakeholder List

Table I-1 outlines the agencies, tribes, and other stakeholders that were notified of the proposed project and potential for early coordination. A template general coordination letter and tribal coordination letter follow. Materials used to coordinate project details with the Pennsylvania Department of Conservation and Natural Resources and State Historic Preservation Office are available in **Appendix C** and **Appendix F**, respectively.

TABLE I-1. AGENCIES, TRIBES, AND OTHER PROJECT STAKEHOLDER CORRESPONDENCE

Stakeholder	**Scoping / Early Coordination**		**Draft EA** (placeholder)		**Final EA** (placeholder)	
	Submitted	Comments Received	Submitted	Comments Received	Submitted	Comments Received
Federal Agencies						
US Army Corps of Engineers (USACE)	7/5/2021					
US Fish and Wildlife Service (USFWS)	7/5/2021					
US Environmental Protection Agency (USEPA)	7/5/2021	8/17/2021				
US Natural Resource Conservation Service (NRCS)	7/5/2021	8/19/2021				
US Federal Aviation Administration	7/5/2021					
State Agencies						
PA Department of Conservation and Natural Resources (PDCNR)	7/5/2021	7/12/2021				
PA Department of Environmental Protection (PADEP)	7/5/2021					
PA State Historic Preservation Officer (SHPO)	10/4/2021	10/5/2021				
PA Department of Transportation (PennDOT)	7/5/2021					
PA Department of Transportation (PennDOT)	7/5/2021					
Local Entities						
Allegheny County Health Department	7/5/2021					
Allegheny County Conservation District	7/5/2021					
US Steel	7/5/2021					
Borough of West Mifflin	7/5/2021					

Stakeholder	**Scoping / Early Coordination**		**Draft EA** (placeholder)		**Final EA** (placeholder)	
	Submitted	Comments Received	Submitted	Comments Received	Submitted	Comments Received
Tribal Nations						
Absentee-Shawnee Tribe of Oklahoma	12/17/2021					
Delaware Nation of Oklahoma	12/17/2021					
Eastern Shawnee Tribe of Oklahoma	12/17/2021					
Oneida Indian Nation	12/17/2021					
Onondaga Nation	12/17/2021					
Saint Regis Mohawk Tribe	12/17/2021					
Seneca Nation of Indians	12/17/2021					
Seneca-Cayuga Nation	12/17/2021					
Shawnee Tribe	12/17/2021					
Stockbridge Munsee Community, Wisconsin	12/17/2021					
Tonawanda Band of Seneca	12/17/2021					
Tuscarora Nation	12/17/2021					

ALLEGHENY COUNTY AIRPORT AUTHORITY
PITTSBURGH INTERNATIONAL AIRPORT
ALLEGHENY COUNTY AIRPORT

June 29, 2021

US Environmental Protection Agency, Region 3
NEPA Division
1650 Arch Street
Philadelphia, PA 19103-2029

SUBJECT: Notice of Preparation of an Environmental Assessment
For the Improvement of the Runway 10-28 Runway Safety Area
Allegheny County Airport (AGC), Pennsylvania

Dear Sir or Madam:

The Allegheny County Airport Authority (ACAA), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for proposed improvements to the Runway 10-28 Runway Safety Area (RSA). The EA is being prepared in accordance with the National Environmental Policy Act of 1969, Council of Environmental Quality regulations, and FAA Order 10.50.1F, Environmental Impacts: Policies and Procedures. It is anticipated the Draft EA will be completed in late 2021 or early 2022 for agency and public review. After consideration of the environmental findings and public and agency comments, the FAA will make its decision to either prepare an Environmental Impact Statement or issue a Finding of No Significant Impact.

On behalf of the FAA, we are sending you this letter to:

1) inform you of the preparation of the EA,
1) request any information relevant to project's environmental setting to be considered in the EA, and
2) obtain an understanding of any interest, issues, concerns your agency may have regarding the Proposed Project.

Proposed Project Location

The airport is located in West Mifflin, Allegheny County approximately nine miles from Pittsburg, Pennsylvania (Enclosure 1). The airport is flanked by Lebanon Road (State Highway 885) and Union Railroad line to the west and Lebanon Church Road (State Highway 148) to the south and east. The airport boundary at the Runway 10 end is also adjacent to the Southern Taylor Landfill and Treatment Plant. The airport is generally situated among residential, commercial, and industrial land uses and was built on top of a hill with steep slopes abutting the existing RSAs.

Background

A Runway Safety Area (RSA) is a rectangular box surrounding a runway that is designed to enhance the safety of aircraft that undershoot, overrun, or otherwise leave the paved runway surface. An airport must keep the RSA cleared, graded, drained, and accessible by firefighting and rescue equipment. RSA standards and dimensions are defined by the FAA based on the type of aircraft using the airport. In the case of AGC, a standard RSA would be 500 feet on either side of the runway, extend 1,000 feet beyond the end of the runway, and be no more than 3 percent slope for 200 feet off the runway end and at maximum 5 percent thereafter. In situations where land is not available or if existing obstacles make a standard RSA impossible, the FAA works with the airport to find alternative solutions. FAA regularly re-evaluates standard and non-standard RSAs and requires incremental improvements as applicable.

Description of the Proposed Project

The Proposed Project would correct the nonstandard length, width, and grading for the Runway 10-28 RSA to meet safety requirements as established by the FAA for runways serving the types of aircraft that typically access the airport. The Proposed Project includes expanding the Runway 10 and Runway 28 RSAs with fill, installing an Engineered Material Arresting System (EMAS) at each Runway end, and widening the mid-Runway 28 RSA. Other related improvements include re-routing service roads that would be impacted by the fill and establishing stormwater management features to support the new areas as necessary. An EMAS uses crushable, lightweight material placed at the end of a runway to stop an aircraft that overruns the runway. The Proposed Development Project is depicted on Enclosure 2.

Need for the Proposed Project

A standard RSA for Runway 10-28 at AGC is not feasible. The Runway 10-28 RSA has been determined to be 793 feet short on the eastern end and 1,000 feet short on the western end. The area off the Runway 10 end has an approximately 20% grade, and the area off the Runway 28 end has a 7.6% grade. There is also development around the runway that cannot be reasonably relocated, such as the highways, railroad, landfill, and housing developments.

We appreciate your input on the proposed RSA improvement project. If you would like additional information or to discuss the project, you can contact me at 412-472-5647 or nschubel@flypittsburgh.com. You may email your comments and information to me or mail them to Pittsburgh International Airport Landside Terminal, 4th Floor Mezz. PO Box 12370 Pittsburgh, PA 15231. Please also confirm your preferred method of delivery, address, or point of contact to receive the Draft EA for review later this year. If possible, please provide your input within 14 days of receipt of this letter.

Sincerely,

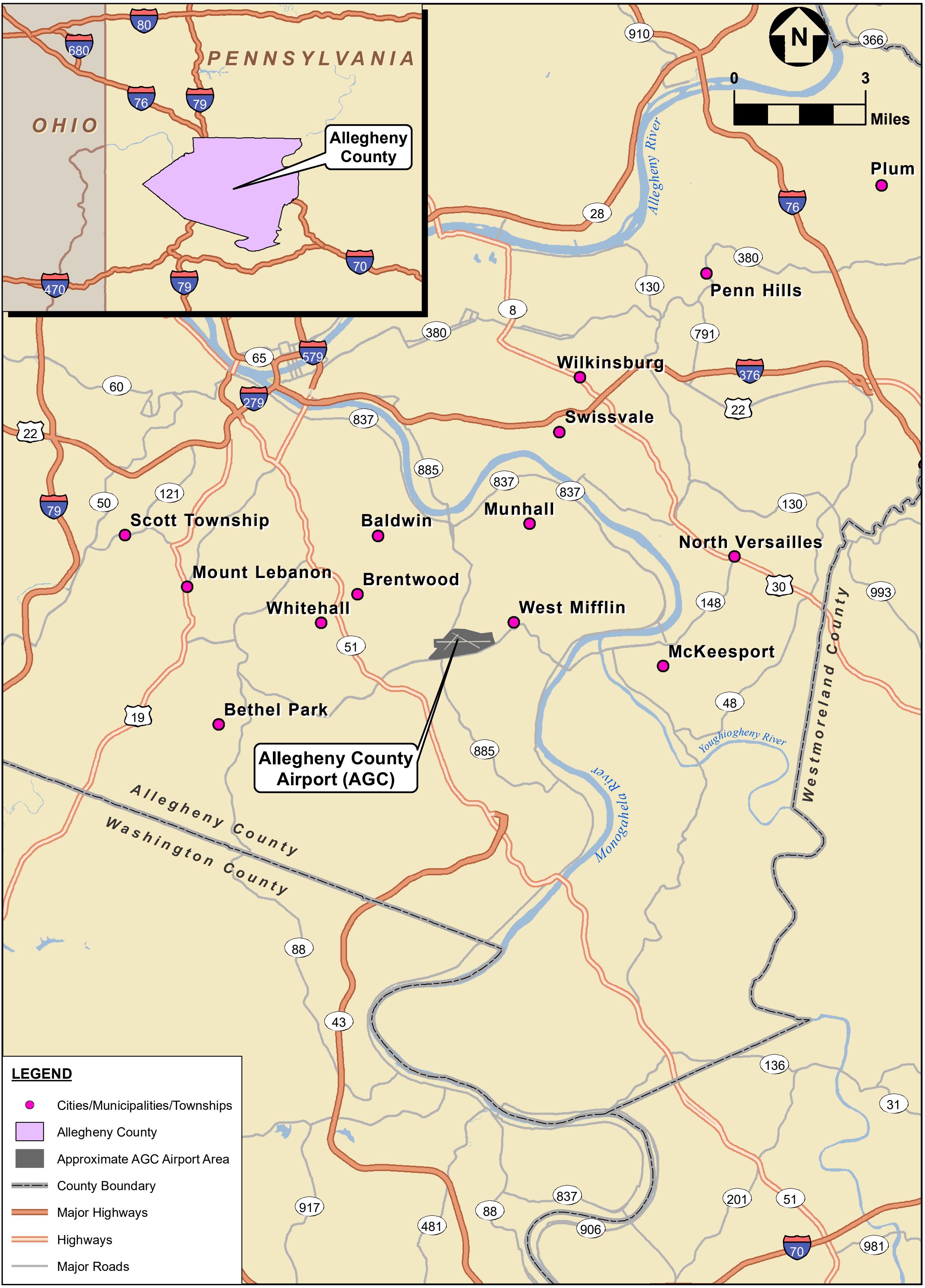
Nicholas Schubel
Project Manager, Civil

CC: Federal Aviation Administration, Harrisburg Airports District Office
US Army Corps of Engineers, Pittsburg District
US Environmental Protection Agency, Region 3
US Natural Resource Conservation Service
PA Department of Environmental Protection, Waste Management, Clean Water, and Waterways and Wetlands
PA Department of Transportation, District 11
PA Department of Transportation Bureau of Public Transportation, Bureau of Aviation
Allegheny County Health Department
Allegheny County Conservation District
US Steel
Borough of West Mifflin, Township Manager

Enclosures:
1. Project Location
2. Proposed Development Project

Enclosure 1

Airport Location

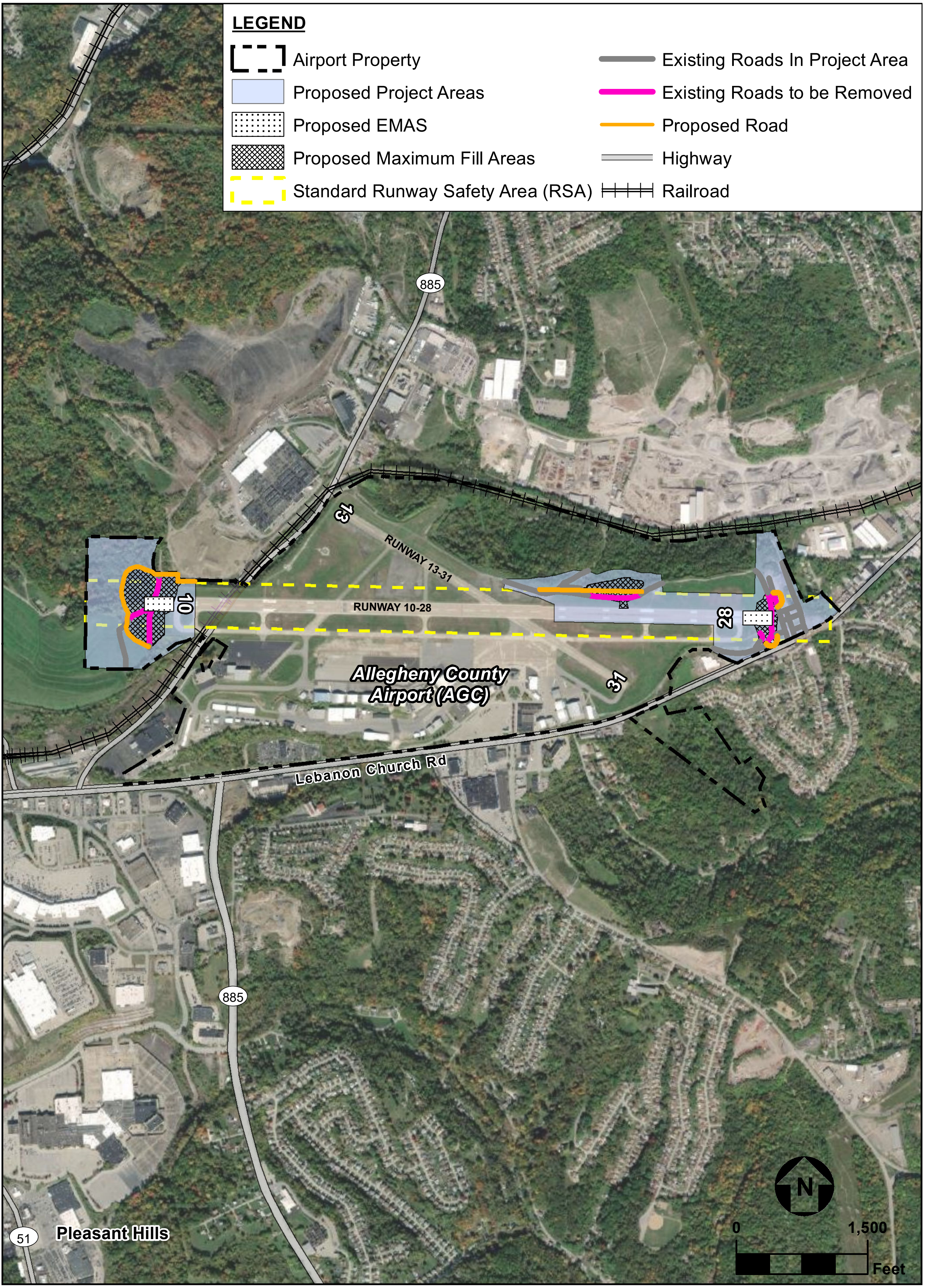


Source: Esri; ESA, 2020

AIRPORT LOCATION
ALLEGHENY COUNTY AIRPORT

Enclosure 2

Proposed Project



Date: 6/9/2021
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Source: Esri; GAI; Adapted by ESA, 2021.

I-3: Early Project Coordination

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports Division
Eastern Region
Delaware, Pennsylvania, New Jersey

FAA, Harrisburg Airports District Office
3905 Hartzdale Drive, Suite 508
Camp Hill, PA 17011
717-730-2830
717-730-2838 (Fax)

December 17, 2021

Devon Frazier, Tribal Historic Preservation Officer
Absentee-Shawnee Tribe of Oklahoma
2025 South Gordon Cooper Drive
Shawnee, OK 74801

**RE: Notice of Preparation of an Environmental Assessment
For the Improvement of the Runway 10-28 Runway Safety Area
Allegheny County Airport (AGC), Pennsylvania**

Dear Madam:

The Allegheny County Airport Authority (ACAA), in coordination with the Federal Aviation Administration (FAA), is preparing an Environmental Assessment (EA) for proposed improvements to the Runway 10-28 Runway Safety Area (RSA) at Allegheny County Airport (AGC, Airport). The FAA has determined that the Proposed Project represents a federal undertaking as defined in 36 Code of Federal Regulations (CFR) § 800.16(y) and Section 163 of the FAA Reauthorization Act of 2018. The EA is being prepared in accordance with the *National Environmental Policy Act* of 1969 (42 U.S.C. §§ 4321-4335), Council of Environmental Quality (CEQ) regulations (40 CFR parts 1500-1508), and FAA's NEPA implementing procedures and policies as provided for in Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, and guidance provided in the 1050.1F Desk Reference. It is anticipated the Draft EA will be available in early 2022 for agency and public review. After consideration of comments, the FAA will make its decision to either prepare an Environmental Impact Statement or issue a Finding of No Significant Impact.

On behalf of the FAA, we are sending you this letter to:

1) inform you of the preparation of the EA,
2) request any information relevant to the Proposed Project's environmental setting to be considered in the EA, and
3) to obtain an understanding of any interest, issues, or concerns your tribe may have regarding the Proposed Project.

This letter is intended to initiate government-to-government and project-specific Section 106 consultation between the FAA and the Absentee-Shawnee Tribe of Oklahoma and solicit any comments you may have on the proposed undertaking. The FAA is also initiating consultation with the tribes that were consulting parties to the FAA and Pennsylvania State Historic Preservation

Office (SHPO) Programmatic Agreement for AGC (2008) and Amendment (2021), including: the Delaware Nation of Oklahoma; Eastern Shawnee Tribe of Oklahoma; Oneida Indian Nation; Onondaga Nation; Saint Regis Mohawk Tribe; Seneca Nation of Indians; Seneca-Cayuga Nation; Shawnee Tribe; Stockbridge Munsee Community, Wisconsin; Tonawanda Band of Senecca; and Tuscarora Nation.

Proposed Project Location

The Airport is located in the Borough of West Mifflin, Allegheny County approximately nine miles from Pittsburgh, Pennsylvania (**Enclosure 1**). The Airport is bordered by Lebanon Road (State Highway 885) and a Union Railroad line to the west and Lebanon Church Road (State Highway 148) to the south and east. The airport boundary at the Runway 10 end is also adjacent to the U.S. Steel South Taylor Environmental Park Landfill and Treatment Plant. The Airport is generally situated among residential, commercial, and industrial land uses and was built on top of a hill with steep slopes abutting the existing RSAs.

Background

A Runway Safety Area is a rectangular area surrounding a runway that is designed to enhance the safety of aircraft that undershoot, overrun, or otherwise leave the paved runway surface. Per FAA regulations, an airport must keep the RSA cleared, graded, drained, and accessible by firefighting and rescue equipment. RSA standards and dimensions are defined by the FAA based on the type of aircraft using the airport. In the case of AGC, a standard RSA would be 500 feet on either side of the runway, extend 1,000 feet beyond the end of the runway, and have no more than 3 percent slope for 200 feet off the runway end and a maximum 5 percent thereafter. In situations where land is not available or if existing obstacles make a standard RSA impossible, the FAA works with the airport to find alternative solutions. FAA regularly re-evaluates standard and non-standard RSAs and requires incremental improvements as applicable.

Description of the Proposed Undertaking and Area of Potential Effect

The Proposed Undertaking would improve the Runway 10-28 RSA to meet safety requirements as established by the FAA for runways serving the types of aircraft that typically access the airport. The Proposed Undertaking would place fill material (clean dirt or stone) in three distinct areas on airport property in the Runway 10-28 RSA, including mid-runway and at both runway ends. This fill would correct the nonstandard slope in all three areas, fix the width of the RSA in the mid-runway location, and level the RSA surface for approximately 335 feet beyond each runway end. An Engineered Material Arresting System (EMAS), designed to compensate fully for the remaining RSA length deficits, would also be installed at both ends of the runway. An EMAS uses crushable material placed at the end of a runway to stop an aircraft that overruns the runway. Other related improvements include re-routing service roads, relocating airport and utility infrastructure that would be impacted by the fill, and establishing stormwater management features to support the newly expanded RSAs as necessary. The Proposed Undertaking is depicted on **Enclosure 2**. As the intent is limited to the placement of fill, with the exception of the need to relocate existing utilities to outside of the fill area there is no excavation and minimal soil disturbance associated with the Proposed Undertaking.

The direct impacts of the Proposed Project would be limited to the fill areas and areas directly adjacent as the unpaved airport service roads and relocated utilities would be located along specified areas on the edge of the new fill. In some areas the topography would be elevated 50 feet above the existing grade.

The impacts associated with this Proposed Undertaking are anticipated to be less than but fully contained within the Proposed Project Area; therefore, we recommend that the Area of Potential Effect (APE) coincide with the Proposed Project Area boundary. The Proposed Project Area at the Runway 10 end is approximately 36 acres and at the Runway 28 end/mid-runway area it is approximately 48 acres.

Need for the Proposed Undertaking

A standard RSA for Runway 10-28 at AGC is not feasible. The Runway 10-28 RSA has been determined to be 1,000 feet short on the Runway 10 (western) end and 793 feet short on the Runway 28 (eastern) end. The area off the Runway 10 end has an approximately 20 percent slope, and the area off the Runway 28 end has a 7.6 percent slope. There is also development around the runway that cannot be reasonably relocated, such as the highways, railroad, landfill, and housing developments.

Cultural Resources at AGC

A Programmatic Agreement made between FAA and the Pennsylvania SHPO in July 2008 (amended February 2021) identifies 280 acres of the 432-acre airport property as a National Register-eligible Historic District, encompassing airport buildings, structures, and runways. The 2021 Programmatic Agreement Amendment states that improvement to the Runway 10-28 RSA can proceed without NHPA Section 106 consultation. The 2008 Programmatic Agreement also notes that to develop the airport, most of AGC property was cut, filled, and graded. Hilltops were removed in excess of 20 to 30 feet and the peripheries of the property were filled in excess of 30 feet, essentially eliminating the potential for finding prehistoric archaeological resources over most of the property. No archaeological sites have been identified in these areas, and the Undertaking has a low probability for containing prehistoric sites according to the statewide archaeological model.

SHPO Coordination / Determination of Effect

On October 4, 2001, ACAA placed an Environmental Review Submission on the PA-SHARE database to ensure that all areas within the APE were considered and cleared in the 2021 Programmatic Agreement Amendment. The PA-SHPO replied on October 5, 2021, stating that they had no concerns and no effects were anticipated to above ground or archaeological resources.

It is the opinion of the FAA that the Proposed Undertaking would not affect historic, archaeological, or cultural resources listed in, or eligible for listing in the National Register. The main objective is to place fill in the Project area, and any ground-disturbing utility relocation activities will include special conditions in the event of unexpected discoveries.

Opportunity to Initiate Consultation

As a consulting party to the 2008 Programmatic Agreement and 2021 Amendment, we appreciate your input on the proposed RSA Improvement Project. If you would like additional information or to discuss the Proposed Project, you can contact Heather Davis-Jenkins, Environmental Protection Specialist, at 717-730-2835. You may also email your comments and information to her at *Heather.davisjenkins@faa.gov* or by U.S. mail at 3901 Hartzdale Drive, Suite 508, Camp Hill, PA 17011. If possible, please provide your input within 30 days of receipt of this letter. Should you desire not to continue to participate in this Project, a negative response would be appreciated; otherwise, we will forward an electronic copy of the Draft EA to you when it is available.

Sincerely,

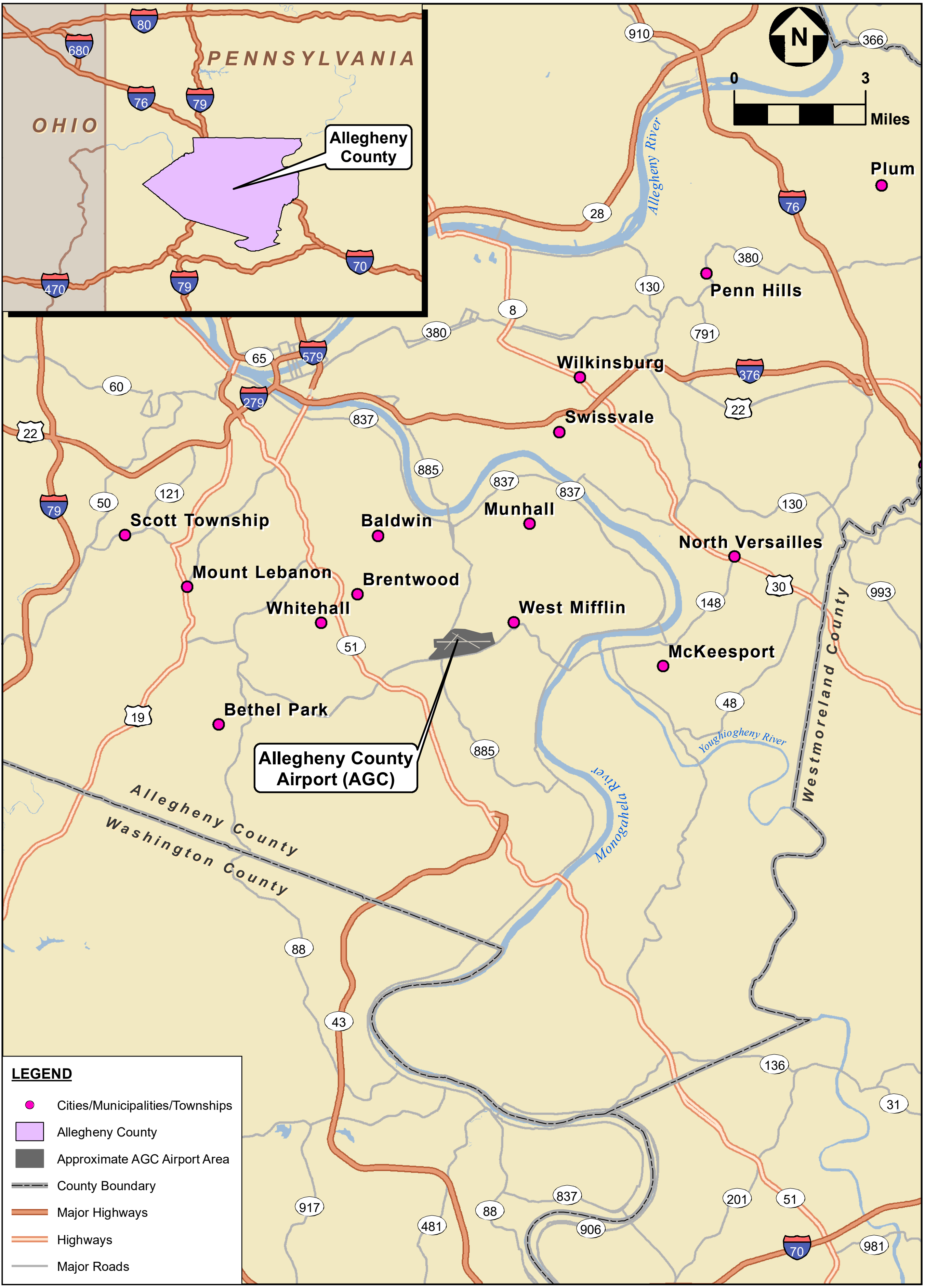
Rick Harner,
Manager

CC: Heather Davis Jenkins, FAA
Charles Sacavage, FAA

Enclosures:
1. Airport Location
2. Proposed Undertaking

Enclosure 1

Airport Location



Date: 1/5/2021
U:\Projects\Temporary Items\sdb\AGC\Ex_# Airport Location Map_v2.mxd

Source: Esri; ESA, 2020

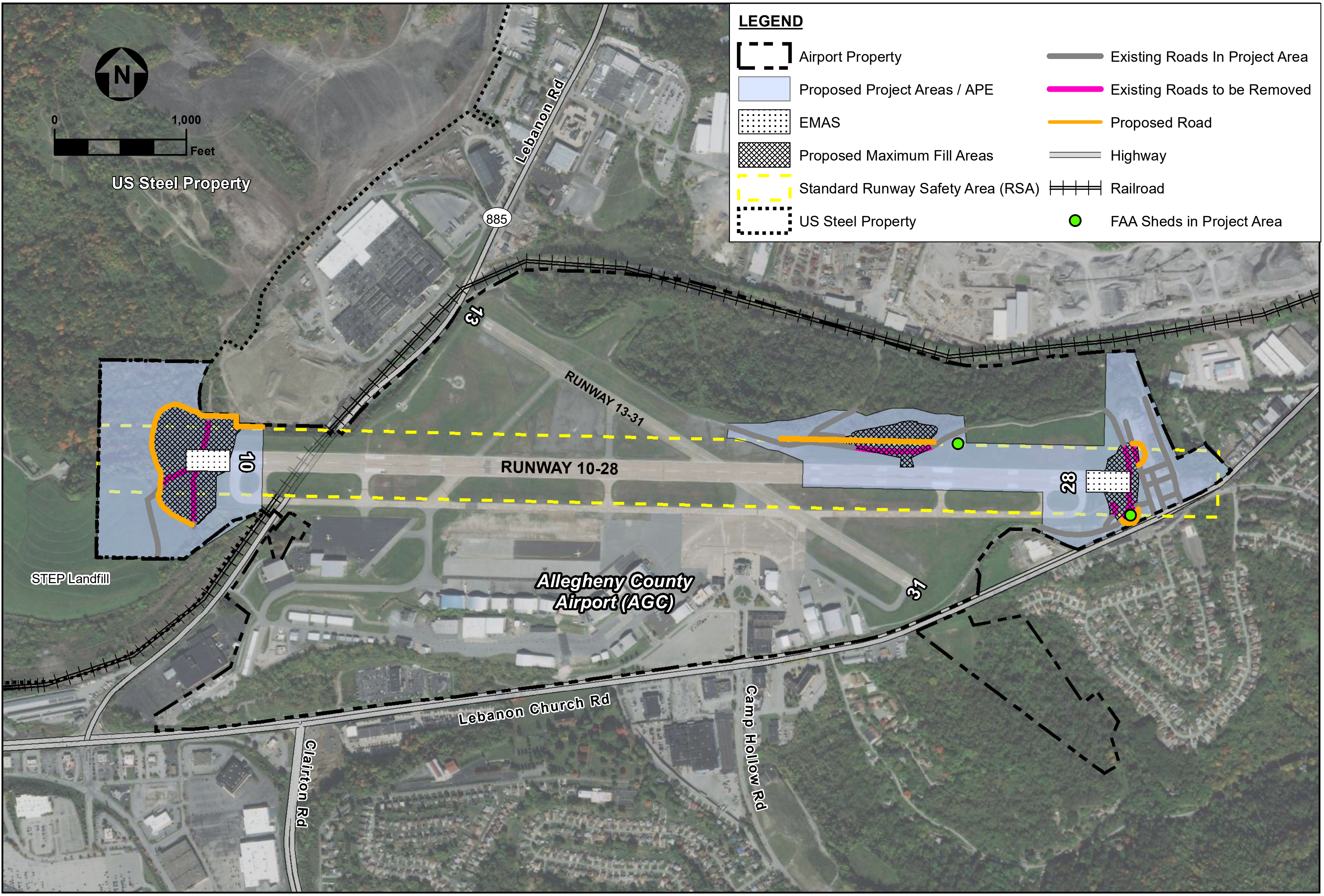
Allegheny County Airport Environmental Assessment

FIGURE #-#

AIRPORT LOCATION
ALLEGHENY COUNTY AIRPORT

Enclosure 2

Proposed Undertaking



Date: 11/22/2021
U:\GIS\GIS\Projects\19xxxx\D201901425_EA for AGC Runway 10-28 RSA\03_MXDs_Projects\Novemeber 2021 EA Maps\Fig1-4_Proposed Project Study Areas.mxd

Source: Esri; GAI; Adapted by ESA, 2021.

FIGURE 1-4
PROPOSED PROJECT STUDY AREAS